



A. Walther del. et sculp.





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THE 12213. cl. 3.  
 YOUNG MAN'S  
 Book of Knowledge:  
 BEING A  
 PROPER SUPPLEMENT  
 TO THE  
 YOUNG MAN'S COMPANION.  
 In FIVE PARTS, viz.

PART I. Of Knowledge in general; the Advantages of gaining it early, with a Definition thereof. Of God, his Essence and Attributes. Of the Origin of Nature, and first Formation of Things. Chronological Tables of the Knowledge of historical Events from the *Saxon* Heptarchy, *A. D.* 455, to the present Time.

PART II. Geography, in a Manner entirely new: Containing, (by Question and Answer) 1. A general Description of the four Quarters of the World. 2. The Situation, Extent, and chief Cities of the several Kingdoms and Countries of each Quarter. 3. The Nature and Description of the Globes, and Explanation of the Terms used in Geography. 4. Tables of the Latitude and Longitude of several principal Places; with many useful and necessary Problems on the Terrestrial and Celestial Globes.

PART III. Geometry and Astro-

nomy, Navigation and Plain-failing; with many useful, easy, and instructive Problems for the young Practitioner in the further knowledge of those Sciences.

PART IV. Natural Philosophy in general.

PART V. Theology, containing an Account of the Religion and Laws of Nature. Supernatural Theology. Observations on the Holy Scriptures, which teach us the Knowledge of God and our Duty. Account of Judaism, Paganism, Christianity, and Mahometanism. Of the Sects of the Jews. Different Tenets of the principal Sects or Professors of Christianity. Of the Heathen Mythology, and Alphabetical Account of the Heathen Deities. Of Music and Vibration. Definition of Music. Gamut or Scale, and Explanation of dividing Notes in Time, &c. Of the Diatonic Scale, an Explanation. Different Keys, Time, Bass, &c. &c.

By D. FENNING,

Author of the ROYAL ENGLISH DICTIONARY, UNIVERSAL SPELLING-BOOK, USE of the GLOBES, &c. &c. &c.

L O N D O N:

Printed for S. CROWDER, in Pater-Noster-Row; and  
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## RECOMMENDERS.

WE whose Names are hereunto subscribed, beg Leave to recommend the following Work to the Public in general: For though the Subjects are many, and every one of them useful, yet they are so well digested, and treated of in so plain a Manner, that it cannot fail of being very useful in Schools, and of great Service to Mankind in general.

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The Rev. Mr. FISKE.

The Rev. Mr. FONTAINE.

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*Islington*.





TO THE RIGHT HONOURABLE  
WILLIAM BECKFORD,

Lord Mayor of the City of *London*, and one of  
their Representatives in Parliament.

My LORD,

**A**S it is too common to find Dedications carried to too high an Extreme of flattering Encomiums; I persuade myself Your Lordship will the more readily accept of This, in the plain Dress of Simplicity, as I am sensible it is not agreeable to Your Lordship to be flattered.

I acknowledge, my Lord, the Presumption is too great; but being sensible of Your Lordship's Readiness to promote every thing that is of public Service and Utility, I was induced to lay this Work at Your Lordship's Feet: And the World cannot but commend me for sending it abroad under the Favour and Protection of One, who is not only a Lover of Learning, a Promoter of all Commerce and Industry; but One, whose candid Disposition, true Patriot Spirit, and undaunted Bravery, has been so eminently distinguished in opposing every Measure that has appeared inconsistent with the Liberty of the Press, and a Free People.

My

## DEDICATION.

My Lord, as I am proud of professing myself a firm Protestant, I cannot but rejoice that my Patron is so truly attached to his present Majesty, our most gracious Sovereign, and a Lover and Encourager of all His true and faithful Subjects: And Your Lordship will always stand in the List of those worthy Patriots who honour their King and promote Harmony among the People.

Though the following Lucubrations have cost me much Time and Labour; yet I think myself duly compensated in having the Honour of sending them into the World under Your Lordship's Sanction and Approbation.

I am,

My Lord,

With due Regard and Submission,

Your Lordship's most obliged,

And most obedient humble Servant,

July 16,  
1763.

D. FENNING.



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# To the R E A D E R,

But more particularly the

Grown up YOUTH of GREAT BRITAIN  
and IRELAND.

YOUNG GENTLEMEN,

**I** Here present you with a Work that has been wanted for many Years, and that cannot fail to be of Service to Mankind in general; and I have waited a long Time, expecting it might have been done by a much abler Hand: but whether it has been for want of Thought of doing public Service, or whether for want of Condescension in Persons of greater Abilities, I cannot pretend to determine; evident it is, that it has not been done in a Book of this Price.

2. Every Thing has its Defects; and therefore a Work upon so many Subjects, in so short a Compass, cannot be without: But, if it be ever so short, yet if it be but so plain and intelligible, to convey a general Idea of Things, or to give the Reader a particular Account of the different Branches of the more superior Parts of Learning, that is sufficient: If it does *this*, it answers the Design it was intended for; and a candid, impartial Reader will pardon the more trivial Errors and Deficiencies.

3. Every Person who has perused the Sheets allow, that what is here treated of is both short and conspicuous, and that it certainly will be of great Service



to Mankind in general, but particularly to the following Persons: First, to all such Persons who love to improve themselves at all Opportunities; but have either left School too soon, or have not had the Advantage of reading different Authors, or conversing with such as could improve them. 2dly. It will be of Service to all such who have had a more superior Education than at every common School, (such as Academies, &c.) who are conscious they have in Time-past neglected their Learning, to the Prejudice of their Tutors, and their own palpable Mortification. And, 3dly. It cannot fail of being a great Help to all adult Persons, and grown up Youth in Town and Country, who are sincere Lovers of Improvement; but have neither had Time to read, nor Ability to purchase different Authors upon so many Subjects; and yet they have a hearty Desire of being improved, and take equal Delight to improve others also: — These are the Persons for whom the following Sheets were more particularly designed: For such may, with Propriety, be called the true Lovers of Learning, and they are justly entitled to the Labour of every Author, because they do him Honour in endeavouring to understand whatever he treats of, and encouraging others to do the same.

4. But there is another Sort of Youth, who more particularly deserve Pity, and yet it is impossible to speak any Thing concerning them, without in some Measure exposing their Folly. These I would address with all the Marks of Love and Tenderness; that they may the more readily attend to what I say, and take up a Resolution to regulate their Conduct for the Time to come.— I mean those pretended polite and fashionable young Bloods and Blades, who call themselves Gentlemen, on Account of a superior Fortune, and are very fond you should know they have

have had a better Education than others—But are so far from being fond of making a good Use of it, that they take a Delight to ridicule it, and discourage the very Thing that they vaunt themselves upon.—However inconsistent this may appear, yet it is a Fact beyond Contradiction.—Are there not Hundreds (nay, Thousands) who have had no less than an academical, and many who have had even a collegiate Education, with such Advantages of Time and Fortune, that they might very easily have been Masters of several Languages, and have known the Theory of the Sciences in general. But instead of *this*, they give such a Loose to their Passions, and follow the first Thought that prompts them to every Pleasure, without considering in the least, how, where, or in what Manner it will end.—Say not this is Detraction.—For do we not see many Youths, (especially in our Metropolis) who spend the main Part of that beautiful Stage of Life, from sixteen to twenty-six at least, in very little else but such low, idle Trash, and wretched, inconnected, inconsistent Stuff and Nonsense, that were it not for some Difference in their Dress, and sometimes a little more polite outward Behaviour, rather than their Conversation, they could not be distinguished from the more base, vulgar, illiterate, and unlearned.

Thus, instead of becoming *shining* Examples to others in Learning and good Sense, they abuse every Talent that kind Providence has bestowed upon them; never think of the many indulgent Favours of their Parents and Friends, nor value how they grieve *them*; disgrace their Tutors, and scandalize Learning in general.

In short, there are some, who, by a long Continuance in Vice, and a total Neglect of all good

Learning and Morality, are become so abandoned and incorrigible, that it is the highest Insult if you offer to reprove them ever so gently, or advise them in ever so pressing and tender a Manner: For, if they can but boast and brag that they were born to a larger Fortune, or have had a better Education than others, they think these rotten Pillars are sufficient to support the whole System of their Pride, Balderdash, and Ribaldry.

5. From hence appears the wide Difference between Industry and Idleness: For it is evident, that there are a great many who have had very little or no Education, and yet by constant reading and diligent Observation, have, in a short Time, become far better Scholars than many others, who had all the possible Advantages of Learning, but have paid very little Regard to it while at School, and much less when they are out of it.

6. If this be the true State of the Case, (as it is plain it is) who then would be such an Enemy to himself, to idle away his Time and not try to learn something? And who but giddy hair-brain'd Youth, or Mad-men and Fools, would wilfully neglect and forget what they were taught? Remember, young Gentlemen, that it is an unvariable and universal Maxim, that Self-love is inseparably linked to our very Nature; and therefore, it is absurd for any of you to say, you really love yourselves, while you neglect all Opportunities of improving both your Minds and your Morals.

7. Having made these Observations of the different Sorts of Youth, and desiring they would seriously consider the Advantages of gaining an early Knowledge, I shall now give some Account of the Work itself.

8. The

8. The Title-page sufficiently sets forth the whole of this small Treatise at one View; but I know it is expected, there should be some further Description of the Particulars, and some Apology made for the Reason of the Undertaking.

9. The chief Intention (as said before) is for the further Improvement of all industrious Youth, and the Reason of making it public is, because they might learn something of the most material Subjects at a small Expence.

10. I do not pretend to say the whole is an Original: The historical Parts, in Course, I must have borrowed or quoted from other Authors: And they have no greater Claim for what was done before their Time than I have; for they were obliged also to write from the supposed Testimonials of others: If then what I have selected of this Sort be short and plain, and the principal Parts be well digested, that is sufficient; the shorter it is, the more engaging, the less burthensome, and the sooner understood and retained.

11. As to the *Geometrical, Trigonometrical, Astronomical, and Philosophical Part, &c.* I have taken all the Care, (within the Compass of such a Limitation) to be as plain and intelligible as I could; and that the young *Tyro* might not be at a Loss in the first Rudiments of Geometry, &c. I have given him the Draught or Figure of every Operation in the Margin or Page of the Work, in order that he may the more readily comprehend the Problems; and as for the short Treatise on *Music*, I have been careful to omit nothing that might help both its Theory and Practice; and I persuade myself it will be of service both to instrumental as well as vocal Performers: For as there are great many who understand the Theory very well, and yet cannot play



play at all ; so there are Numbers who can play very well, and yet have very little Judgment in the Rules of Harmony and Composition ; and had not the Sheets been extended beyond their first Limitation, I should have been much fuller upon this Subject ; but I hope there are sufficient Hints for every diligent Reader.

12. As for critical *Carpers*, and half learnt Cox-combs, I am content to share the Fate of my Betters, in whatever Constructions they please to make, desiring only this, that they would take Care for their own Credit, not to animadvert upon Things they don't understand, on purpose to detract and lessen the industrious, well-designed, and useful Performances of others.

In fine ; let me persuade all Lovers of Learning to be constant and diligent in searching after Truth. Let neither the Gay nor the Giddy dissuade you from pursuing, nor prevail upon you by any Means whatever, to neglect your Duty to God and yourself. Therefore,

Keep always such Company as *You* may improve, or that may improve *You* : And if your Companions cannot make *You*, nor *You* *Them* better ; remember to leave them, rather than be made worse by them.

*I am, kind Reader,*

*Your Well-Wisher,*

D. F.

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THE  
YOUNG MAN'S  
Book of Knowledge, &c.

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PART I.

*Of KNOWLEDGE in general : The Advantage of gaining early Knowledge ; with a Definition of true Knowledge to that which is commonly called so, &c.*

DIALOGUE I. SECT. I.

Between TYRO, a Learner, and PHILO, his Instructor.

TYRO. **W**HAT do you mean by Knowledge ?

PHILO. Knowledge, in general, signifies Skill, Judgment, or Understanding : Or, Knowledge more strictly signifies Learning and Erudition, which is the Faculty of forming true and just Ideas of Things, and of perceiving and judging right of the Nature of the Object sought after.

TYR. What do you mean by an Idea ?

PHIL. An *Idea* is the first Conception, Form, Model, or Pattern of a Thing existing in our Imagination, Mind, or Fancy ; and therefore, *Tyro*, you should be very careful to form true and just Ideas of Things, and then you will always be able to discover Truth from Falshood.

TYR. I grant, Sir, that it is the highest Wisdom in Youth, to furnish their Minds betimes with the true Knowledge of Things.

PHIL. I am glad you are sensible of this ; for it is really a melancholy Truth, that the Generality of Mankind do not seek after Knowledge at all ; or else they mistake the Word Knowledge, and call that Learning or Knowledge, that really

is not so; and others there are that abuse their Education, frustrate the good Designs of their Friends, and are content to let the common Follies and Gaieties of Life possess their whole Souls and Inclination to such a Height, that they center all Knowledge in (what they call) Taste, and neglect so much the common Duties of Life, and the Practice of Literature in general, that they are Babes in Knowledge at the Age of forty; and Nothing can convince them of the Want of it, but their own dear-bought Experience, when having by Extravagancies run through a sensible Fortune, they very often (too late) find that true Knowledge is as inconsistent with Supineness and Carelessness, as true Happiness is with Wickedness and Folly.

TYR. This is very true, Sir, indeed: but pray what do you call true Knowledge, or what Branches of Literature do you call the best of Knowledge?

PHIL. I am not to determine for you and the rest of Mankind; because there are many different Degrees of Knowledge, *viz.* a Knowledge of the different Languages, such as *Latin, Greek, Hebrew, &c.* is a fine Qualification, but few are Masters of it, for Want both of Time and Fortune; and many that have Time and Fortune, are so very lame and deficient in their Studies, that they make such a poor Figure in the World, as will not bear an Examination.

TYR. Very true, Sir: But what else do you call that Knowledge which Mankind in general should be acquainted with; for every Person has not Time to learn different Languages?

PHIL. Why, *Tyro*, the Question is hardly fair, because of the different Opinions and Delights of Mankind. But if I must give my Opinion, I think that some Knowledge of the *Latin* and *Greek* Languages (without which we can never be perfect Masters of our own) with a good Proficiency in Arithmetic, and a reasonable Pursuit after some higher Branches of the Mathematics, such as *Geometry, Trigonometry, Astronomy, Algebra, &c.* is certainly the best and most necessary temporal Knowledge; because it carries with it the greatest Satisfaction, built upon Truth itself, and leaves not the Mind at all in Doubt and Suspense.

TYR. It is very true, Sir. But is there no other Knowledge necessary to furnish the Mind with in our early Days?

PHIL. Yes; a more necessary Knowledge than all the rest, and to which they ought all to submit, till the Mind is in some Measure first furnished with it.

TYR. What is that, pray?

PHIL. An early Knowledge of *God*, as is revealed to us by his divine Law in the holy Scriptures.

TYR. I grant, Sir, what you say to be true: But you know it is not fashionable at all, neither is the Knowledge of the holy Scriptures in any Respect counted necessary for the Qualification of the Gentleman at this Time of Day.

PHIL.



PHIL. It is very true, *Tyro*, indeed ; but notwithstanding this, yet it is evidently plain, that no Man was ever less a Gentleman for being virtuous ; nor do the holy Scriptures clash with the common Order of Decency and Good-breeding, by teaching the Rich to know their Dependence, and to be easy of Access ; and the very Poorest of all to be humble, easy, and content in their Stations, and behave well to their Superiors.

In short, whatever may be thought necessary for a *modern* Gentleman, I know not ; but I am very sensible that the Knowledge of God is a necessary Qualification for every Christian and every Gentleman. — The Practice of it is productive of every Thing that is good : It is a Bulwark against all Evil ; and when it is pursued under a true Sense of our Duty, (at a proper Time and Manner, according to the Design of its divine Institutor,) is so far from hindering other Things, that it accelerates us in all our lawful Undertakings ; and though it will not make a *Fop* of the *modern* Taste, yet, by teaching us the greatest Decency, it learns us the truest Gentility, *viz.* Humility.

TYR. From whence, pray, arises the Ignorance of the Knowledge of God, in an Age where every-body has Time and Opportunity both to instruct themselves, or be instructed ?

PHIL. It arises from many Causes ; but the two principal Causes are, the Neglect of reading the Word of God, and the customary (I may say fashionable) Breach of the Sabbath. The Example being set by too many Persons of all Denominations, the rising Generation follow them, and few indeed know their real Duty, for Want of knowing their great Obligation to God ; and as few know God, for Want of reading the holy Scriptures.

TYR. Very true, Sir : I should be very glad then you would inform me a little more concerning God, his Nature, and Attributes, &c.

PHIL. With all my Heart.

## S E C T. II.

*Of God ; his Essence, Attributes, &c.*

TYR. What is God ?

PHIL. God is a *supreme, eternal, self-existent, necessary, and independent* Being : The Creator, Preserver, Governor, and Disposer of all Things, and all Events, both past, present, and to come \*.

TYR. What do you mean by God's Attributes ?

PHIL. His Excellencies and Perfections, *viz.* he is *eternal, invisible, immortal, incomprehensible, omnipotent, omniscient, and omnipresent* : He is also *all-wise, all-powerful, all-knowing* ;

\* Rev. i. 8, 11.



full of Wisdom, Power, Justice, Mercy, Goodness, and Truth,  
 &c.

TYR. What do you mean by being *incomprehensible*?

PHIL. He is a Being so great, that he cannot be conceived or  
 comprehended.

TYR. What do you mean by *omnipotent*?

PHIL. Almighty --- Having all Things in Heaven and Earth  
 under his Word, Power, and Command.

TYR. What is to be understood by God's being *omniscient*?

PHIL. The Power and Faculty of knowing all, and all man-  
 ner of Things that are past, present, and to come, with the  
 Certainty of their coming to pass.

TYR. What is the Meaning of *omnipresent*?

PHIL. God's being present every where, at all Times, and  
 in all Places. --- And this should teach us, *Tyro*, to be very  
 cautious and circumspect in all our Actions, as all Things, and  
 all the most secret Actions, Designs, or Intentions, are naked  
 and open to the Eye of *Him* with whom we have to do.

### S E C T. III.

*Of the Origin of Nature, and the first Formation of Things.*

TYR. What do you mean by the first Formation of Things;  
 or, how and in what Manner were they created?

PHIL. You must not expect I should give you a very long De-  
 tail of the very first Principle of Things: Nor is it indeed ne-  
 cessary that I should tell you the different Opinions of the Learn-  
 ed, concerning the active Parts of Matter. It is sufficient if I  
 tell you their various Opinions, and lead you at last into  
 Truth.

First then, *Anaxagoras* affirmed that all Things were formed  
 or generated from small Particles, or minute Corpuscles, of  
 Matter, entirely alike (he says, but not how, at first formed);  
 which being amassed or joined together, produced or formed all  
 Things.

2. *Aristotle* (much later) held not only the same Principle of  
 a fortuitous Concurrence of Atoms, but went further, and says,  
 the original Cause of all Things is from *Matter*, *Form*, and  
*Privation*; and that the whole Order of Nature is produced by  
*Chance*\*. This his Opinion continued in Vogue a full Century,  
 and even some to this Day most ignorantly and wickedly ad-  
 here to, and submit to this Absurdity, as much as to the Au-  
 thority of divine Revelation.

\* Of this ridiculous Notion of *Matter* and *Chance*, see Part III. un-  
 der that Head.

3. *Hesiod, Diogenes, Heraclitus, (Hippias), and Thales*, help and maintained the four Elements to be the only Principle of all natural Things and created Beings: *viz. Hesiod* says, that it was Earth which first sprung from Chaos. *Diogenes* says, all Things were formed of Air, which being both soft and flexible, is capable of receiving all Shapes.

*Heraclitus, &c.* affirmed, that Fire was the first Mover of all Things; and *Thales* and his Followers maintained, that Water was the first principal Cause. Their different Reasons for supporting either of these Arguments are so long, contradictory, and ridiculous, that they are better omitted, since it is evident neither of them are right, at least all cannot be so.

TYR. Very surprising, that Men of such Learning should maintain Principles so contrary to each other, and to Truth itself. But, pray, were these the only Men?

PHIL. No; many were their Followers, *viz. Anaximenes, Empedocles, Melissus, Xenophanes, Archelaus, Zareta, Oenopides, Pythagoras, Mochus, Plutarch, Zeno, Chrysippus, Socrates, Plato, &c. &c.* Some of these joined and stuck very close to the different Opinions of the first, and yet neither two agreed among themselves concerning the true Cause of created Beings, and their Formation, any more than they could afterwards about the *summum bonum*, or Chief Good, or the true Object of Good, *Homage, Obedience, Adoration, &c.*

TYR. You are very kind, Sir: But how am I to distinguish between *right* and *wrong*, since such learned Men as these differ so much, and each lays down his own Sentiments as Truth?

PHIL. Their differing so much is a plain Proof there is no Certainty in either of them; and that their Schemes are absurd, and (upon the whole) inconsistent to Reason.

TYR. But what surprizes me is, that even *now* many Men of Learning and good Sense, follow many of their Principles, in believing the World is eternal, and that Matter always existed.

PHIL. Very true; too many believe so, but did ever any give a Proof of it, either physically, or metaphysically?

TYR. I do not know: But still, how am I to avoid falling into Error after all?

PHIL. Why, *Tyro*, you must take Care of every Author, and of every Acquaintance, and be resolved with yourself, not to be so far imposed upon, as to believe these Inconsistencies; for as it is evident Matter has not a Power to *think*, much less has it to *act*, therefore as the Elements could not create themselves, they must have been created by some other Hand, who must necessarily exist in and of himself, *viz. God*.

TYR. I thank you, Sir; and it plainly appears to me a Contradiction, for Matter to exist of itself; and I am satisfied that there is one eternal, immortal, and self-existent Being,

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who not only at first created all Things, but that these Things which he so created, depend also upon his Preservation.

PHIL. I should be very glad every Person had so firm a Belief and Dependance on God; for the very Preservation of his Church, and curbing or preventing the Designs of powerful as well as wicked Men, is a plain Proof of his governing all and all manner of Events, and that no Purpose, Design, Contrivance, or Expedition of Man can go beyond the Limits of his Permission — Chance has no real Meaning.

## SECTION IV.

*Contains Chronological or General Tables of Knowledge of Things, according to their proper Objects and Time.*

### TABLE I.

*Of the Saxon Heptarchy.*

	A.D.
1. <i>Vortigen</i> first King of <i>Kent</i> - - - -	455
2. Kingdom of the <i>South-Saxons</i> contained <i>Surry</i> and <i>Sussex</i> , continued One hundred and thirteen Years. <i>Ella</i> first King thereof, and <i>Ethelwolph</i> first Christian King, - - - - }	488
3. Kingdom of the <i>West-Saxons</i> contained what we now call <i>Cornwall</i> , <i>Devon</i> , <i>Dorset</i> , <i>Somerset</i> , <i>Wilts</i> , <i>Berks</i> , and <i>Hampshire</i> , continued Three hundred Years, began <i>Cberdick</i> first King thereof, and <i>Hingels</i> first Christian King.	519
4. Kingdom of <i>Northumberland</i> at this Time contained the Counties of <i>York</i> , <i>Durham</i> , <i>Lancaster</i> , <i>Westmorland</i> , <i>Cumberland</i> , and <i>Nottinghamshire</i> , and continued Three hundred and seventy-nine Years, began to be so <i>Ella</i> and <i>Ida</i> the first Kings thereof, and <i>Edwin</i> the first Christian King.	527
5. Kingdom of <i>Mercia</i> contained the Counties of <i>Oxford</i> , <i>Glocester</i> , <i>Worcester</i> , <i>Salop</i> , <i>Cheshire</i> , <i>Stafford</i> , <i>Warwick</i> , <i>Buckingham</i> , <i>Huntingdon</i> , with Part of <i>Hertford</i> , <i>Northampton</i> , <i>Rutland</i> , <i>Lincoln</i> , <i>Leicester</i> , <i>Derby</i> , and <i>Nottinghamshires</i> : This Kingdom continued Two hundred and two Years, began <i>Cerda</i> was first King, and <i>Peada</i> the first Christian King.	582
6. Kingdom of the <i>East-Angles</i> contained <i>Norfolk</i> , <i>Suffolk</i> , and <i>Cambridgeshire</i> : This Kingdom continued Three hundred and fifty-three Years, began <i>Uffa</i> was the first King thereof, <i>Redwald</i> the first Christian King, and <i>Edmond</i> the last King, whom the <i>Danes</i> slew, and he was buried at a Village then called <i>Heglisdune</i> , but afterwards (in Honour to <i>Edmond</i> ) called <i>St. Edmond's Bury</i> .	775

TABLE

## TABLE II.

*Of the chief British Princes that contended with the Saxons for their Country's Right.*

A.D.

1. <i>Vortigern, Vortimer his Son, and Aurelius Ambrosius,</i> from 393, to	- - - - -	497
2. <i>Uter Pendragon</i>	- - - - -	497
3. <i>Arthur, Son of Pendragon</i>	- - - - -	516
Buried at <i>Glastenbury</i>	- - - - -	542
4. <i>Constantine, Son of Cador</i>	- - - - -	542
Buried at <i>Stonehenge.</i>		
5. <i>Aurelius Conanus</i>	- - - - -	545
6. <i>Vortiporus</i>	- - - - -	578
7. <i>Malgo Conanus</i>	- - - - -	581
8. <i>Caractacus</i>	- - - - -	586
9. <i>Cadwin</i>	- - - - -	635
10. <i>Cadwallo, or Cadwallin, his Son</i>	- - - - -	635
<i>Gulielmus and Faustinus archbishops of Canterbury.</i>		
11. <i>Cadwallador, Son of Cadwallo,</i>	- - - - -	685
Buried at <i>St. Peter's at Rome</i>	- - - - -	689
A great Pestilence, which lasted Eleven Years.		

## TABLE III.

*Of the most noted Kings of the Saxon Heptarchy.*

A.D.

1. <i>Hengist King of Kent, &amp;c.</i>	- - - - -	455
2. <i>Ella first King of the South Saxons</i>	- - - - -	479
3. <i>Cherdick first King of the West Saxons</i>	- - - - -	485
<i>Vodinus and Theodorus Archbishops of London.</i>		
4. <i>Kenrick second King of the West Saxons</i>	- - - - -	485
5. <i>Cbelwin, Son of Kenrick, third King</i>	- - - - -	560
6. <i>Ethelbert King of Kent</i>	- - - - -	562
<i>Augustine the Monk Archbishop of Canterbury.</i>		
7. <i>Redwald third King of the East-Angles</i>	- - - - -	624
8. <i>Edwin the Great, King of Northumberland</i>	- - - - -	626
<i>Paulinus Abp. of York built the Cathedral of Lincoln.</i>		
9. <i>Oswald third King of Northumberland</i>	- - - - -	633
<i>Honorius and Deus-dedit Archbishops of Canterbury.</i>		
10. <i>Vulfhere sixth King of the Mercians</i>	- - - - -	668
11. <i>Ethedred seventh King of Mercia</i>	- - - - -	674
Turns Abbot	- - - - -	685
12. <i>Kenred eighth King of Mercia</i>	- - - - -	686
13. <i>Cbeldred ninth King of the Mercians</i>	- - - - -	690
14. <i>Ethelbald tenth King</i>	- - - - -	716
<i>Cuthbert and Brogmus Archbishops of Canterbury.</i>		
Creed, Lord's Prayer, and Ten Commandments translated	- - - - -	703

A noted

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	A.D.
A noted total Eclipse of the Sun	733
A remarkable Eclipse of the Moon	756
15. <i>Offa</i> eleventh King of the <i>Mercians</i>	758
Custom of Pledging in Drinking	789
16. <i>Egfrýd</i> , Son of <i>Offa</i> , twelfth King of <i>Mercia</i>	794
17. <i>Kanwolp</i> thirteenth King	795

## TABLE IV. Of the Saxon Monarchs.

	A.D.
1. <i>Egbert</i> , crowned at <i>Westminster</i>	819
Buried at <i>Westminster</i>	826
2. <i>Ethelwolp</i> , Son of <i>Egbert</i>	836
Died at <i>Stanbridge</i> , buried at <i>Westminster</i>	857
3. <i>Ethelbert</i> , first Christian King	860
Buried at <i>Sherbourne</i>	866
<i>Lambert</i> and <i>Ethelard</i> Archbishops of <i>Canterbury</i> .	
4. <i>Ethelred</i>	865
Died at <i>Willington</i> , buried at <i>Westminster</i> .	
5. <i>Elfred</i> , or <i>Alfred</i> , fourth Son of <i>Ethelwolp</i> , anointed at <i>Rome</i> by Pope <i>Leo</i> , and crowned at <i>Winchester</i> *	872
<i>Lambeth</i> and <i>Athelard</i> Archbishops of <i>Canterbury</i> .	
<i>Celnoth</i> succeeded <i>Lambeth</i> .	
<i>London</i> , burnt by the <i>Danes</i> in 839, rebuilt	886
6. <i>Edward</i> , the elder Son of <i>Alfred</i> , crowned at <i>Kingston</i>	901
Died at <i>Farringdon</i> , buried at <i>Winchester</i>	924
<i>Atholme</i> Archbishop of <i>Canterbury</i> .	
<i>Manchester</i> rebuilt.	
7. <i>Ethelstan</i> crowned at <i>Kingston</i>	924
Died at <i>Glocester</i> , buried at <i>Malmesbury</i>	940
<i>Ulfelinus</i> , or <i>Wolstane</i> , Archbishop of <i>Canterbury</i> .	
<i>Elfrick</i> , the learned Abbot, wrote an Epistle to <i>Wolstane</i> , to avoid Transubstantiation.	
Now (if ever) flourished the famous <i>Guy</i> earl of <i>Warwick</i> .	
8. <i>Edmund</i> , fifth Son of <i>Edward</i> , crowned	940
Stabbed, and buried at <i>Glastenbury</i>	946
9. <i>Edred</i> , sixth Son of <i>Edward</i> ,	946
Buried at <i>Winchester</i>	955
<i>Otho</i> Archbishop of <i>Canterbury</i> .	

\* *Alfred* had the Gospel first translated into the *Saxon* Tongue, the Lord's Prayer in which ran thus:

"Fæder ure thu the eart on Heafenum, si thin nama gehalod, to  
"be cume thin Rice, Gewarthe the Villa on Eorðan swa swa on He-  
"afenum, urne ce dæghwanllæan hlaf," &c.

10. *Edwy*,



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A.D.

- |     |  |      |
|-----|--|------|
| 10. | <i>Edwy</i> , eldest Son of <i>Edmund</i> , crowned at <i>Kingston</i>   | 955  |
|     | Buried at <i>Winchester</i>  | 959  |
| 11. | <i>Edgar</i> , surnamed <i>the Peaceable</i> , crowned at <i>Kingston</i> by <i>Otho</i>   | 959  |
|     | His royal Navy consisted of 3600 Ships.  |      |
|     | Buried at <i>Glastenbury</i>   | 975  |
|     | <i>Elfus</i> and <i>Dunstan</i> Archbishops of <i>Canterbury</i> .   |      |
|     | <i>Ethelwald</i> Bishop of <i>Winchester</i> *, in the Year 973, sold the Vessels of the Church to relieve the Poor in Extremity ; and being asked the Reason, he said that it was a Shame that senseless Temples should abound with Riches, while the lively Temples of the Holy Ghost should be in Want. |      |
| 12. | <i>Edward</i> , surnamed <i>the Martyr</i> , crowned at <i>Kingston</i>  | 975  |
|     | Died with a Stab in his Back, and buried at <i>Shaftsbury</i> .  |      |
|     | <i>Ethelgar</i> and <i>Elfrick</i> Archbishops of <i>Canterbury</i> .  |      |
| 13. | <i>Ethelred</i> , surnamed <i>the Slow</i> , crowned at <i>Kingston</i>  | 978  |
|     | <i>Ipswich</i> sacked by the <i>Danes</i> .  |      |
|     | <i>London</i> burnt by the <i>Danes</i> , and <i>Ethelred</i> brought under an annual Tribute to them of 40,000 <i>l.</i> called <i>Dane-gelt</i> .  |      |
|     | The <i>Danes</i> destroyed by the <i>English</i> , by a secret Commission from the King, in every City, on the 30th of <i>November</i>   | 1002 |
|     | <i>Swein</i> King of <i>Denmark</i> sent a large Navy against <i>England</i> .   |      |
|     | <i>Canutus</i> the <i>Dane</i> assisted with Two hundred Sail.   |      |
|     | <i>Ethelred</i> died, buried at <i>St. Paul's</i> ,  | 1016 |
| 14. | <i>Edmund</i> , surnamed <i>Ironside</i> , crowned at <i>Kingston</i>  | 1016 |
|     | <i>Livingius</i> Archbishop of <i>Canterbury</i> .   |      |
|     | <i>Canute</i> the <i>Dane</i> besieged <i>London</i>   | 1017 |
|     | <i>Elrick</i> the Traitor killed <i>Edmund</i> , and carried his Head to <i>Canute</i> , and for his Reward <i>Canute</i> placed his Head on the highest Gate of the City.   |      |

## TABLE V.

### Of the Danes.

- |    |  |      |
|----|--|------|
| 1. | <i>Canute</i> crowned at <i>London</i> by <i>Livingius</i>                             | 1017 |
|    | <i>Egnoth</i> Archbishop of <i>Canterbury</i> .  |      |
|    | <i>Ashden</i> Church in <i>Essex</i> built after the Victory gained over <i>Edmund</i> | 1025 |
|    | The Monastery at <i>Edmundsbury</i> built nearly at the same Time.                     |      |
|    | <i>Canute</i> died, and buried at <i>Winchester</i>                                    | 1035 |
|    | <i>Issue</i> , <i>Swein</i> , <i>Harold</i> , and <i>Hardicanute</i> .                 |      |

\* See Dr. *Howell's* History of *England*.

2. *Harold*,



2. *Harold*, base Son of *Canute*, surnamed *Harefoot*, crowned at *Oxford* - - - 1035  
Died at *Oxford*, buried at *Winchester* - - - 1040
3. *Hardicanute* crowned at *London* - - - 1040  
He caused the dead Body of *Harold* to be taken up and thrown into the *Thames*; but a Fisherman, says our Historian \*, took it up and buried it in *St. Clement's*, in the *Strand*, since called *St. Clement Dane's*, the Church-yard being a great Burial-place for the *Danes*.  
He fell down dead at a Banquet at *Lambeth*, and was buried at *Winchester* - - - 1042

## TABLE VI.

Of the Saxons between the Danes and William the Conqueror.

A.D.

1. *Edward*, for his pious Life called *the Confessor*, he was Son of *Ethelred*, was in *Normandy* at the Death of *Hardicanute*, and the *Englisch* Nobility, wearied with *Danish* Slavery, invited him to *England*, and he was crowned at *Winchester* by *Edsine* Archbishop of *Canterbury* - - - 1042  
He punished his Mother for Incontinence.  
He founded *St. Margaret's, Westminster*.  
He died, and was buried at *Westminster* - - - 1066  
*Earl Goodwin* choaked by eating Bread before the King at *Windfor*.
2. *Harold*, Son of *earl Goodwin*, crowned - - - 1066  
*Edgar* right Heir to the Crown.  
*Harold* created him *Earl of Oxford*.  
*Stigand* Archbishop of *Canterbury*.  
*William* Duke of *Normandy* landed in *Suffex*, Sept. 28.  
He challenged *Harold* in single Combat, Oct. 13.  
Battle at *Hastings* in *Suffex*, Saturday October 14.  
*Harold* slain with two of his Brothers, most of the *Englisch* Nobility, and of Soldiers between sixty and seventy thousand.  
*William* had three Horses shot under him, lost only six thousand and thirteen Men.  
*Harold* buried at *Waltham* in *Essex*.  
A dreadful Comet.

## TABLE VII.

Of the Normans, &amp;c.

1. WILLIAM the Conqueror crowned - - - 1066  
*Aldred* Archbishop of *Canterbury*.

\* See Dr. Howell, p. 46. and Roynant, p. 60.

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A.D.

- Landfrank* Archbishop of *Canterbury*. 1066  
*William* died at *Roan* in *Normandy* - - 1087  
 2. **WILLIAM** *Rufus* crowned - - 1087  
 Shot by Accident by *Sir Walter Tyrrel*, *August 1*, 1100  
 Buried at *Winchester*.  
 Sixty Houses blown down in *London*, by a high Wind,  
 and the Roof of *Bow Church*, six Beams of which  
 were drove twenty Feet into the Ground.  
 A monstrous blazing Star.  
 The Sea broke over the Banks in many Places, and  
 destroyed Abundance of People and Cattle.  
 3. **HENRY I.** named *Beauclerk*, crowned at *Westminster* 1100  
 River of *Thames* almost dry from the Tower to the  
 Bridge - - 1115  
*Woodstock* Palace built.  
*Henry* died at *St. Denys* in *Normandy*; his Bowels,  
 Brains, and Eyes buried at *Roan*, and his Body was  
 sliced and salted, put into a Bull's Hide, and buried  
 in the Abbey at *Reading* - - 1135  
 4. **STEPHEN** (by the false Oath of *Hugh Bigot*, and by  
 Means of *Henry* Bishop of *Winchester* and Bishop of  
*Sarum*) was crowned at *Winchester* by *Corbell* Arch-  
 bishop of *Canterbury* - - 1135  
 A Fire began at *London-stone*, burnt eastward to *Ald-*  
*gate*, westward to *St. Paul's*.  
*Stephen* died of the Piles at *Dover*, and was buried at  
*Feversham*.  
 He erected the Abbies of *Coggeshall* in *Essex*, and *Fa-*  
*most* in *Lancashire*, &c.

## TABLE VIII.

The Saxon Line restored:

1. **HENRY II.** called *Plantagenet*, crowned at *West-*  
*minster* by *Theobald* Archbishop of *Canterbury* 1154  
*Thomas Becket* Archbishop of *Canterbury*.  
 Base Issue was, *William Longspur*, and *Geoffrey* Archbp.  
 Fair *Rosamond* poisoned by *Queen Eleanor* at *Woodstock*,  
 buried at *Godstone*.  
*Henry* died, and was buried at *Font-Everard* 1189  
 2. **RICHARD I.** crowned at *Westminster* by *Baldwin*  
 Archbishop of *Canterbury* - - 1189  
 Now revelled *Robin Hood* and *Little John*.  
*Richard* killed from the Castle of *Chaluz*; his Bowels  
 buried at *Charron*, his Head at *Roan*, and his Body  
 at *Font-Everard* - - 1199  
 3. **JOHN**

3. JOHN (by the Assistance of *Eleanor* his Mother) was crowned at *Westminster* by *Hubert* Abp. of *Cant.* 1199  
 He surrenders the Crown to the Pope's Nuncio. 1199  
 Poisoned by a Monk, and buried at *Worcester* 1216  
*London* Bridge began to be built of Stone by *Peter* of *Colechurch* a Priest, and finished in 1209; and shortly after that a Fire happened, and about three thousand Persons lost their Lives.
4. HENRY III. crowned by *Magnus* Archbp. of *Cant.* 1216  
 Four mock Suns seen from Morning to Evening, after which followed so great a Dearth and Famine that above twenty thousand perished in *London* 1235  
*St. Edmund* Archbishop of *Canterbury* 1257  
*Baliol* College in *Oxford* founded - 1263  
*Boniface* Archbishop of *Canterbury*.  
*Robert Kilwarby* Archbishop of *Canterbury* 1272  
*Henry* died at *St. Edmondsbury*, buried at *Westminster* 1272  
 His Issue was *Edward*, *Edmund* surnamed *Crouchback*, *Richard*, *John*, *William*, and *Henry*; also *Margaret*, *Beatrice*, and *Catherine*.  
 N. B. According to *Dr. Howel*, he laid the first Stone of the new Work of *Westminster* Abbey.
5. EDWARD I. surnamed *Longshanks*, crowned at *Westminster* by *Kilwarby* - 1272  
 He slew *Llewellyn*, and subdued *Wales*, and caused his Son *Edward* to be born there, and created him Prince thereof.  
*Merton* College in *Oxford* founded - 1274  
*John Peckham* Archbishop of *Canterbury*.  
 Wheat sold at *London* for 3 s. 4 d. per Quarter 1288  
 Two hundred and ninety-seven Jews executed for defacing the King's Coin.  
 Battle between him and the *Scots*; two of the King's Ribs broke by a Kick of his own Horse, notwithstanding he proceeded, and seventy thousand *Scots* were slain at *Fawcirk* - 1300  
 Pope *Boniface* insists that the King should not proceed further against the *Scots*; but an hundred Peers subscribed their Names to stand by the King, dated at *Lincoln* - 1301  
*Galter Reynold* Archbishop of *Canterbury*.  
 A Synod at *Reading* ordained that no Person in the Ecclesiastics should hold more than one Benefice.  
*John Stratford* Archbishop of *Canterbury*.  
*Eleanor* his Wife died at *Kerdeby* in *Lincolnshire*, and where her Hearse rested Crosses were erected: Buried at *Westminster*.

# BOOK OF KNOWLEDGE. 13

A. D.

*Edward* died of a Dysentery at *Burgh upon Sands*, and buried at *Westminster* - - - 1307

Issue, *John*, *Henry*, *Alphonso*, and *Edward*, and five Daughters.

6. EDWARD II. of *Caernarvon* crowned - - 1307  
*John Orford* Archbishop of *Canterbury*.

The Scots beat the English at *Bannocksburn*, and kill seven hundred Knights - - 1316

The Scots make Inroads into *England*.

Bishop of *Exeter* beheaded.

*John Stratford*, a Baker, drawn on a Hurdle, for making Bread under Size.

A terrible Famine, that the King's Household could scarcely be supported; and yet Wheat was sold by Order for 11 s. per Quarter, a good fat Ox for 1 l. 4 s. a fat Hog for 3 s. 4 d. a good Hen for 1 d. &c. This was the fourth Year of his Reign.

His Wife *Isabella* conspired against him, and having got the chief of the nation, she wages war against her Husband *Edward*, and takes many Places; she took *Hugh Spenser* the Elder at *Bristol*, and commanded him to be cut up alive and quartered; took her Husband Prisoner at the Abbey of *Neath*.

King *Edward* resigned the Crown to his Son - - 1327

His Issue was *Edward*, *John*, *Joan*, and *Eleanor*.

7. EDWARD III. crowned eight Days after his Father's Resignation - - 1327

He released his Father out of *Kenelworth* Castle, and delivered him to those two unworthy Knights *Thomas de Gurney* and *John Meltravers*, who conveyed him to *Berkley* Castle, and there murdered him by running a red-hot Spit up his Body, September 22.

*Thomas Bradwardin* Archbishop of *Canterbury*.

*Simon Islip* Archbishop of *Canterbury* - - 1330

King's College *Cambridge*, and *Eton* College near *Windsor*, founded - - 1341

Lord *Mortimer* hanged at *Tyburn*, then called the *Elme*.

Arms of *England* quartered with those of *France*.

*William Wittlesey* Archbishop of *Canterbury* - - 1346

*Queen's* College in *Oxford* founded - - 1347

*Pembroke* Hall and *Clare* Hall founded.

*Southampton* burnt by the French - - 1348

A blazing Star for thirty Days.

A great Plague in *Christendom*, which continued till the Year - - 1357

This Plague swept off nearly Nine Tenths of the People of *England*; and History says there were buried in

the *Charter-house* Church-yard, above Fifty Thousand; and this Plague was followed by a Murrain among the Cattle, and a great Dearth.

Now flourished the famous *John Wickliffe*, of the University of *Oxford*; he taught his Followers to avoid Mass, Adoration of the Host, Transubstantiation, &c. They were called *Lollards*, among whom were many Persons of Quality, viz. the Duke of *Lancaster*, Sir *John Oldcastle*, Lord *Cobham*, &c.

*Edward* married *Philippa*, Daughter of *William* Earl of *Hainault* and *Holland*.

Died at *Sheen*, aged sixty-five; buried at *Westminster* 1377

His Issue was *Edward*, *William*, *Lionel* John of *Gaunt*, *Edmund*, *William*, *Thomas*; also *Isabel*, *Joan*, *Blanch*, *Mary*, and *Margaret*.

2. RICHARD II. crowned in the eleventh Year of his Age

A Rebellion in *Kent*, headed by *Wat Tyler* and *Jack Straw*, with upwards of One hundred Thousand.

They behead *Simon Tibald* Archbishop of *Canterbury*, and Sir *Robert Hales*, on *Tower-hill*.

They afterwards assemble at *Smithfield*, and *William Wakworth*, Lord Mayor, stabbed *Wat Tyler* before the King, for which he was knighted.

*Jack Straw* executed.

*Richard* marries *Anne*, Daughter of the Emperor *Charles IV*.

*William Courtney* Archbishop of *Canterbury*.

*Thomas Arundel* Archbishop of *Canterbury* 1396

King *Richard* charged with the Breach of his Coronation Oath, and committed to the Tower by *Henry* Duke of *Lancaster*, to whom he resigns the Crown by Force

This Year the Bays and Laurels withered all over England. 1399

*Bedford* River dry of a Sudden for three Miles.

His Queen first taught the *English* Ladies to ride on Side-saddles.

*Richard* deposed 1399

## TABLE IX.

Of the Line of Lancaster.

1. HENRY IV. Son of *John* of *Gaunt*, third Son of *Edward III*. was crowned at *Westminster* by *Arundel* Archbishop of *Canterbury*



# BOOK OF KNOWLEDGE. 15 A.D.

Henry had *Richard's* Body fetched from *Pontefract*, and brought to *St. Paul's*, and then carried to *Langley* in *Hertfordshire*; but *Henry V.* had the Remains taken up, and buried at *Westminster*: aged thirty-three years, and reigned twenty-two years three months.

Gun-powder first invented - - 1400

Great Guns first used at *Berwick* - 1405

A Plague at *London*; upwards of thirty thousand die.

A perpetual Snow from *December* to *March*.

King *Henry* died of an Apoplexy in the forty-seventh Year of his Age, and fourteenth of his Reign; buried at *Westminster* - 1413

His Issue by his first Wife, *Mary*, were *Henry*, *Thomas*, *John*, and *Humphrey*; and two Daughters, *Blanch* and *Philippa*: and two Children by *Joan* his second Wife.

2. HENRY V. crowned at *Westminster* - 1413

*Henry Chicheley* Archbishop of *Canterbury*.

*Sir John Oldcastle* prosecuted for Heresy.

*Richard Plantagenet's* Conspiracy - 1415

The King lands in *Normandy* with ten thousand Men, and kills sixty-thousand at *Agincourt*.

*Sir John Oldcastle* burnt at *St. Giles's* - 1418

*Lincoln College* in *Oxford* founded - 1420

*Catharine*, his Queen, crowned at *Westminster*.

The King dies in *France* in the thirty-fourth Year of his Age and tenth of his Reign - 1422

His Issue only *Henry of Windsor*.

3. HENRY VI. of *Windsor* crowned about the eighth month of his age - 1422

*Thomas* duke of *Exeter* and *Henry Beaufort* Bishop of *Winchester* Guardians.

*Joan Arc* beats the *English* at *Orleans* - 1429

*Joan Arc* taken, and burnt for a Witch at *Roan* - 1430

King *Henry* crowned at *Westminster* - 1431

*John Stratford* Archbishop of *Canterbury* 1437

*James Stuart* (first of the Name) King of *Scotland*, murdered by his subjects - 1447

*John Kemp* Archbishop of *Canterbury*.

*All Souls College* in *Oxford* founded.

*King's College Cambridge*, and *Eton College* near *Windsor*, founded by the King.

*Jack Cade* enters *London*, and is killed - 1450

*Constantinople* taken by the *Turks* - 1453

*Magdalen College* in *Oxford* founded - 1459

*St. Catharine Hall* in *Cambridge* founded.

A.D.

King Henry taken Prisoner by the *Yorkists* 1460  
 Duke of York claims the Crown; but is killed in an  
 Engagement at *Wakefield*, by the Forces under  
*Queen Margaret*.  
 King Henry's Issue was only *Edward*.

## TABLE X.

Line of York.

- A.D,
1. EDWARD IV. eldest Son of *Richard* Duke of  
*York*, crowned at *Westminster* - 1461  
 King Henry taken in Disguise - - 1464  
 King Edward marries Lady Grey - - 1465  
 The Queen crowned at *Westminster*, and delivered of  
 a Daughter named *Elizabeth*, afterwards married  
 to Henry VII. by which the Houses of York and  
*Lancaster* were united, - - 1466  
 King Edward taken Prisoner by the Earl of *Warwick*,  
 &c. - - - 1469  
 He makes his Escape, and obtains a Victory over *War-*  
*wick* - - - 1470  
 King Henry restored by Parliament, and Edward  
 deemed a Usurper - - 1471  
 King Edward, with the Assistance of the *Yorkists* and  
*Dutch*, comes to *London*, and makes Henry Prisoner  
 again.  
 Prince Henry, his Son, killed at *Tewksbury*, by Or-  
 der of Edward.  
 King Henry stabbed in the Tower by *Richard* Duke of  
*Glocester*, about the fiftieth Year of his Age. He  
 was buried first at *Chertsey*, and afterwards remov-  
 ed to *Windfor*.  
 Printing (first practised in *Germany* in 1458) brought  
 to England by *William Caxton* Mercer of *London*.  
 King Edward died at *Westminster*, and was buried at  
*Windfor*, in the forty-second Year of his Age, and  
 twenty-third Year of his Reign - 1483  
 His Issue was Edward, who succeeded him, and *Rich-*  
*ard*; also *Elizabeth*, who afterwards married  
 Henry VII. *Cecilia*, *Anne*, *Bridget* (the Nun) *Mary*,  
*Margaret*, and *Catharine*.  
 EDWARD V. succeeded his father, in the eleventh  
 Year of his Age, but never crowned - 1483  
 Wicked *Richard* Duke of *Glocester*, by his insinua-  
 tions made Protector.

He

A.D.

He murders Lord *Hastings*, as also Sir *Anthony Woodville* his Governor, and several others; and usurps the Throne, after *Edward* had reigned but two Months and eight Days.

**RICHARD III.** usurped the Throne, and crowned at *Westminster* - - - 1483  
 He causes his Nephews *Edward V.* and *Richard* to be murdered, and buried obscurely in the Tower 1484  
*Edward* his only Son dies, and *Anne* his Queen.  
*Richard* killed at *Bosworth*, having reigned two Years and two Months - - - 1485  
 This is the last of the Line of *York* or *Plantagenet*.

## TABLE XI.

*The Families of York and Lancaster united.*

A.D.

**HENRY VII.** Grandson of *John of Gaunt*, fourth son of *Edward III.* crowned at *Westminster*, Oct. 30 1485  
 Yeomen of the Guard first instituted.  
 He marries Princess *Elizabeth*, eldest Daughter of *Edward IV.* by which the Houses of *Lancaster* and *York* are united.  
 The Sweating Sickness first known; carried off two Lord Mayors, six Aldermen, and eight thousand People in *London*.  
*James III.* King of *Scotland* killed at *Bannockburn*, and the Queen crowned - - - 1488  
 Earl of *Warwick* and famous *Perkin* executed 1499  
 A great Plague in England, which maketh the King and Court retire to *Paris* - - - 1500  
*Henry VII.*'s Chapel finished at *Westminster* 1502  
*Christ's* College in *Cambridge* founded by *Margaret* the King's Mother - - - 1506  
 St. *John's* College in *Cambridge* founded by Lady *Margaret* - - - 1508  
 King *Henry* died at *Richmond*, in the fifty-third Year of his Age, and the twenty-fourth of his Reign, and buried in his Chapel at *Westminster*, April 1509  
 His Issue was *Arthur*, *Henry* (who succeeded him), *Edmund*, *Margaret*, *Elizabeth*, *Mary*, and *Catharine*.

**HENRY VIII.** crowned at *Westminster* - - - 1509  
 He marries *Catharine*, his Brother *Arthur's* Widow.  
*Brazen Nose* College founded.  
 Cardinal *Wolsey*, the Pope's Legate, Archbishop of

	A.D
<i>York</i> and Lord Chancellor of <i>England</i> , made prime Minister - - -	1515
Princess <i>Mary</i> (afterwards Queen) born <i>Feb. 18</i>	1516
<i>Corpus Christi</i> College founded.	
<i>Lutheran</i> Religion spreads in <i>Germany</i> -	1517
King <i>Henry</i> writes against <i>Luther</i> , for which Pope <i>Leo X.</i> gave him the Title of Defender of the Faith - - -	1521
Muskets first invented.	
<i>Wolsey</i> pushes for being Pope, but is disappointed	1522
<i>Wolsey</i> disappointed the second Time.	
<i>Henry Fitz-Roy</i> his Base-son - -	1525
The King applies for a Divorce from <i>Rome</i>	1529
The Great Seal taken from <i>Wolsey</i> .	
<i>Wolsey</i> , charged with High Treason, is apprehended at <i>York</i> , and dies at <i>Leicester</i> on the Road	1530
The King abandons Queen <i>Catharine</i> , and is cited to <i>Rome</i> , but refuses - - -	1531
Dr. <i>Cranmer</i> Archbishop of <i>Canterbury</i> , with others, pronounce the Divorce of <i>Catharine</i> -	1533
The King marries <i>Anne Bullen</i> .	
The Queen brought to bed of a Daughter, named <i>Elizabeth</i> , afterwards Queen.	
The Pope insists upon <i>Henry</i> living with <i>Catharine</i> ; but the King and Parliament now throw off all Subjection to <i>Rome</i> - - -	1534
Bishop <i>Fisher</i> and Sir <i>Thomas Moore</i> executed for denying the King's Supremacy - -	1535
<i>Thomas Cromwel</i> Blacksmith, of <i>Putney</i> , made Vicar-general.	
<i>Wales</i> united to <i>England</i> by Act of Parliament	1536
The Bible translated and printed in <i>English</i> .	
Queen <i>Catharine</i> dies, in the fiftieth Year of her Age.	
King <i>Henry</i> jealous of <i>Anne Bullen</i> ; and <i>Cranmer</i> divorces her.	
She is executed in the Tower, <i>May 19</i> :	
The King marries <i>Jane Seymour</i> , <i>May 20</i> .	
Queen <i>Jane</i> delivered of a Son, afterwards <i>Edw. VI.</i> and <i>Jane</i> died the third Day -	1537
The Bible first read in Churches in <i>English</i>	1538
The King marries <i>Anne</i> , Sister of the Duke of <i>Cleves</i> , and divorces her in six Months, by the Instigation of Archbishop <i>Cranmer</i> , &c. -	1540
<i>Thomas Cromwel</i> beheaded for Treason upon Tower-hill.	
The King marries Lady <i>Catharine Howard</i> .	

The

# BOOK OF KNOWLEDGE. 19

A.D.

- The Bishoprics of *Chester*, *Peterborough*, *Glocester*,  
*Oxford*, and *Bristol* founded - 1540  
 Queen *Catharine Howard* accused by *Cranmer* of In-  
 continence, and, without any Trial, beheaded on  
 Tower-hill, February 13, - 1542  
*James V.* King of *Scotland* died.  
*Mary Stuart*, his sole Daughter, born.  
 King *Henry* proclaimed in *Ireland*.  
 St. *Mary Magdalen* College founded.  
 The King marries Lady *Catharine Parr* - 1543  
 An Act was made, that in Case of Failure of the Issue  
 of *Edward* his Son, the Succession to *Mary* and  
*Elizabeth* - - - 1544  
 Horse-pistols first used.  
 Queen *Catharine*, Mrs. *Anne Askew*, and many others  
 condemned for not consenting to six new Articles  
 concerning the Sacraments, &c. They are all ex-  
 ecuted but the Queen.  
*Christ's* College in *Oxford*, and *Trinity* College found-  
 ed - - - 1546  
*William Fawley* slept in the Tower a Fortnight without  
 waking, and lived forty Years afterwards.  
 Hops, Pickerels, and Beer introduced.  
 King *Henry* died January 28, in the fifty-sixth Year  
 of his Age, and thirty-eighth of his Reign.  
 His Issue by his first *Catharine* was *Henry*, another  
 not named, and one Daughter *Mary*, afterwards  
 Queen of *England*: By *Anne Bullen*, the Princess  
*Elizabeth*, afterwards Queen, and a still-born Son:  
 By *Jane Seymour*, one Son, named *Edward*, who  
 succeeded him: By his other three Wives no Issue.

## TABLE XII.

- EDWARD VI. Son of *Henry VIII.* crowned at  
*Westminster* - - - 1546  
*Edward Seymour* Earl of *Hertford* Protector.  
 Popish Images burnt - - - 1547  
*Catharine Dowager* marries Sir *Thomas Seymour* Lord  
 High Admiral, and dies in Child-bed 1548  
*Seymour* attainted of Treason, and beheaded 1549  
 The Protector beheaded - - - 1550  
 King *Edward* dies at *Greenwich*, in the sixteenth  
 Year of his Age, and seventh of his Reign, and  
 buried at *Westminster* \* - - - 1553  
 MARY,

\* He founded St. *Bartholomew's* Hospital, and *Bridewell*: and made  
 great Improvements in *Christ Church*, and St. *Thomas's* Hospital, *South-*  
*wark*,



MARY, only Daughter of Henry VIII.

1553

Lady Jane Grey proclaimed, July 10.

Mary proclaimed July 19.

Dudley Duke of Northumberland sent to the Tower.

Gardiner Lord Chancellor.

Archbishop Cranmer, Guilford Dudley, and his Wife  
condemned for High Treason.

Sir Thomas Wyatt beheaded

1554

Princess Elizabeth committed to the Tower!

John Rogers, the first Martyr of the Times, burnt at  
London; and Bishop Hooper at Gloucester

1555

Coaches first used in England.

Trinity College founded by Sir Thomas Pope.

Bishop Ridley, Latimer, and Archbp. Cranmer burnt.

Archbishop Cranmer burnt at Oxford, and is succeeded  
by Cardinal Pool

1556

St. John Baptist's College in Oxford founded.

Calais (having been near two hundred Years in the  
Possession of the English) surrendered to the French

1557

The Queen taken ill upon the Loss of Calais.

She was some time afterwards brought to bed of an A-  
bortion, and died of a burning Fever, November 17, 1558

Cardinal Pool died.

Historians agree that the Queen was of a good natu-  
ral Temper, but so bigotted to Romish Superstition,  
that no one, for the Time of her Reign, acted with  
more Fury against all Protestants that denied Tran-  
substantiation: For besides many others that were  
cruelly used, there were burnt in Smithfield five Bi-  
shops, twenty-one Ministers, eight Gentlemen,  
forty-eight Artificers, one hundred common Men,  
twenty-six Wives, twenty Widows, and nine  
Maidens; two Boys, two Infants, one of which  
was whipped to Death by Bishop Bonner, justly now  
called Bloody Bonner.

ELIZABETH, only Daughter of Henry VIII. by

Anna Bullen, succeeded her Half-sister Mary by Right

1558

Dr. Parker made Archbishop of Canterbury.

Elizabeth crowned January 15, at Westminster.

Mary Queen of Scots married to the Dauphine

1559

Popish Laws repealed, and an Insurrection in Scotland  
on that Account.

St. Paul's Steeple burnt by Lightning

1561

mark. He was a very pious King, a great Abhorrer of Popery, and  
a noted Encourager of Protestantism and Piety.

The

A.D.

- The Thirty-nine Articles of Religion established in Convocation by *Parker, Grindall, Cox, Horn, Merich, Young, Bullingham, Jewell, Davis, Guest, Berkley, Bentham, Alley, Parre, Barlow, &c. &c.* 1561
- The Queen of Scots, *Henry Stuart* (Lord Darnly) 1565
- She is brought to bed of a Son, afterwards *James I.* of England - - - 1566
- Prince *James* crowned King of Scotland - - - 1567
- Jesús* College in *Oxford* founded - - - 1571
- A great Earthquake, *Feb. 17*, at *Kingston* in *Heredfordshire*, the Ground opened and removed for four Days, so that where plowed Ground was, Pasture Ground took its Place, &c.
- Emmanuel* College in *Cambridge* founded - - - 1573
- The Royal Exchange built by *Sir Thomas Gresham*.
- Campion* the Jesuit, *Dr. Parry*, and several others executed for designing to assassinate the Queen from 1581 to - - - 1585
- John Whitgift* Abp. of *Canterbury* - - - 1577
- Mark Scaliot* made a Lock of Iron, Steel and Brass of eleven Pieces, and a Pipe key, all which weighed but one Grain: As also a Chain of Gold of forty-three Links; the whole he put round the Neck of a Flea in the Presence of *Sir Thomas Gresham* and others, and altogether weighed but one Grain and a half - - - 1578
- Francis Drake* returned from his Voyage round the Globe in about three Years - - - 1580
- Virginia* made an *English* Colony.
- Tobacco first brought into *England* by *Sir Walter Raleigh*.
- Queen of Scots beheaded at *Fotheringay* Castle, aged 46 - - - 1587
- Duelling with small Swords introduced.
- Spanish* Armada set out from *Lisbon*, *May 29*, with 142 Ships to invade *England*, but the brave Admirals, Lord *Charles Howard*, *Sir John Hawkins*, *Sir Francis Drake*, *Sir Walter Raleigh*, &c. (through Divine Providence) with Fire Ships, &c. dispersed them so that but Fifty-three returned back, and near 14,000 were killed and taken Prisoners - - - 1588
- Died of the Plague in *London* 18,000 - - - 1593
- Lopez* the Jew, Physician to the Queen, with several others, executed for designing to poison the Queen 1594
- Lord *Howard* and the Earl of *Essex* take the City of *Cadiz*, *September 15*, and destroy the Ships in the Harbour; the *Lois* was allow'd to be above

	A.D.
20,000,000 of Ducats; they took also the <i>Azores</i> , <i>St. Michaels, Villa Franca, &amp;c.</i>	1596
Prince <i>Charles</i> , afterwards King <i>Charles I.</i> born at <i>Dunferling Castle</i>	1600
Earl of <i>Essex</i> forms a Design against the Queen and is executed, <i>February 25</i> , in the Tower.	
Library at <i>Oxford</i> founded	1601
The Queen died at <i>Richmond</i> , <i>March 24</i> , in the 70th Year of her Age, and 45th Year of her Reign, and was buried in <i>Henry VIIth's Chapel at West-</i> <i>minster, April 28</i>	1603
Her Successor <i>James</i> allowed this, as well as many others, that she was	
<i>Spain's Rod, Rome's Ruin, Netherland's Relief</i> <i>Earth's Joy, England's Gem, World's Wonder, Nature's</i> <i>Chief.</i>	

## TABLE XIII.

Of the Union of the two Crowns.

	A.D.
JAMES I. of England (and VI of Scotland) Son of <i>Henry Stuart Lord Darnley</i> , and unfortunate <i>Mary</i> <i>Queen of Scots</i>	1603
King and Queen crowned at <i>Westminster</i> by <i>Whitgift</i> , <i>Archbp. of Canterbury.</i>	
King <i>James</i> first stiled King of <i>Great Britain</i>	1604
Oath of Allegiance first admitted.	
The Bible translated as now used.	
160 Houses burnt by Fire at <i>St. Edmondsbury.</i>	
Powder Plot discovered, <i>November 5</i> , at Midnight: <i>Guy Faux, Catesbey, Piercy</i> , and many others of the Conspirators executed	1605
<i>Henry Garnet</i> , the Jesuit, confessed his having a hand in the Plot, and was executed <i>March 28</i> , at the <i>West End of St. Pauls</i>	1606
Died of the Plague this, and the preceding Year 161,596.	
<i>New Exchange</i> in the Strand finished	1609
Silkworms brought first to <i>England.</i>	
Allum brought to Perfection by Sir <i>John Bouchion.</i>	
<i>Chelsea College</i> founded.	
Charter House founded by Sir <i>Thomas Sutton.</i>	
Corps of <i>Mary Queen of Scots</i> , removed from <i>Peter-</i> <i>borough</i> to the Chapel Royal at <i>Westminster</i>	1612
Prince <i>Henry</i> died <i>November 6</i> , aged 19, buried at <i>Westminster.</i>	

New

# BOOK OF KNOWLEDGE. 23

	A.D.
New River Water brought to <i>London</i>	1613
A very large blazing Star, followed by Dearth, &c.	
Sir <i>Francis Bacon</i> , Lord Chancellor, and <i>George Villers</i> (Baron of <i>Whaddon</i> and Viscount <i>Villers</i> ) Master of the Horse	1616
<i>Charles</i> , the King's second Son, (afterwards King) Duke of <i>Cornwall</i> , created Prince of <i>Wales Nov. 4.</i>	
Book of Sports published for giving Leave for innocent Recreations after Evening Prayers on <i>Sundays.</i>	
Sir <i>Walter Raleigh</i> executed	1618
Synod of <i>Dort</i> held, and Arminianism condemned <i>April 19.</i>	
A Match proposed between Prince <i>Charles</i> and the Infanta of <i>Spain</i> , but did not succeed.	
The Queen ( <i>Anne</i> ) died at <i>Hampton Court.</i>	
Abbott Archbishop of <i>Canterbury.</i>	
Fatal Vespers at <i>Black Fryars</i>	1623
A Match proposed and concluded upon between Prince <i>Charles</i> and Princess <i>Henrietta</i> , Daughter of <i>Henry IV. of France</i>	1624
<i>Robert Dore</i> of <i>London</i> , Merchant, Taylor, gave a competent Sum that <i>St. Sepulchre's</i> Bell should toll for Prayers on the Day Malefactors from <i>Newgate</i> are executed	1625
The King died of a Tertian Ague 27th of <i>March</i> in the 23d Year of his Reign, and in the 69th Year of his Age, and was interred with great Pomp in <i>Westminster Abbey May 17.</i>	
His Wife was <i>Anne</i> , Daughter of <i>Frederick II. of Denmark.</i>	
His Issue were <i>Henry, Robert, Charles, Elizabeth, Margaret, Mary,</i> and <i>Sophia</i> , all died but <i>Charles</i> and <i>Elizabeth.</i> <i>Elizabeth</i> married <i>Frederick V. Elector</i> , and afterwards King of <i>Bohemia 1613</i> , who begat <i>Sophia</i> Grandmother of his present Majesty.	

## TABLE XIV.

CHARLES I. only surviving Son of <i>James</i>	1625
His Queen <i>Henrietta-Maria</i> lands at <i>Dover</i> , and the Marriage consummated at <i>Canterbury June 13</i> , and arrive at <i>London</i> the 16th.	
The King crowned at <i>London, Feb. 2.</i>	
Died of the Plague in <i>London 35, 417. *</i>	
Sir <i>Francis Bacon</i> died <i>April 9</i>	1626

\* Plague in *London* began in *White Chapel*, the same House, on the same Day of the Month, and the same Number (or thereabouts) died as in the last Year of *Elizabeth*, viz. 41,315.

The

- The King raises Money by Sale of the Crown Lands, by Loans and Ship Mony, and many Gentlemen are committed for refusing to pay, and many others pressed for Soldiers on their Refusal - 1616
- Bishop *Laud*, Bishop *Neale*, and the Duke of *Bucks*, remonstrated against Dr. *Lamb*, murdered by a Mob - 1627
- John Felton* hanged in Chains for stabbing the Duke of *Buckingham* November 19 - 1628
- Charles James* born and died March 18.
- Bishop *Laud* made Chancellor of *Oxford* April 12 1630
- Charles*, afterwards King, born June 27; at whose Birth a bright Star appeared and shone all that Day. [See *Salmon's History*, Page 77.]
- Dr. *Leighton* was sentenced to have his Ears cut off and his Nose slit, for publishing a Book against Prelacy - 1630
- Part of *London* Bridge burnt - 1631
- The King taken with the Small Pox December 2 1632
- The King and Bishop *Laud* goes to *Scotland*, and he is crowned at *Holyrood House* June 18 1633
- Dr. *Abbot*, Archbp. of *Canterbury*, died August 3, and Dr. *Laud* succeeds him.
- Prince *James* (afterwards King) born and baptized at *Somerset House* October 15.
- Sports, &c. on Sundays revived October 18.
- Mr. *Prynne* prosecuted (by *Laud's* Permission) for publishing a Book against the Unlawfulness of Sports, &c. on the Lord's Day, for which he was fined 5000 *l.* expelled the University of *Oxford* and *Lincoln's Inn*, disabled ever to follow the Law, condemned to stand in the Pillory, lose his Ears and be made Prisoner for Life, Feb. 7. [abominable!]
- Lord Chief Justice *Coke* dies September 3 1634
- Archbishop *Laud* aims at universal Conformity, but is opposed.
- The *Scots* discontent with the King and *Laud's* Proceedings, and the Puritans rebel.
- Thomas Parr* born the last Year of *Edward IV.* 1483, died and was buried in *Westminster Abbey* [aged 152] 1635
- An Order made against the Increase of *Hackney* Coaches.
- Princess *Anne* born March 17 - 1636
- The *Scots* enter into Covenant against the Act of Uniformity, the Liturgy, &c. - 1637
- Mary de Medicis*, the Queen's Mother, arrives in *England* October 31 1638
- The



The Scots begin the War, and Lesley seizes *Edinburg*, the Regalia, &c. *February 20.*

Thomas Viscount *Wentworth* subscribes Twenty, and the Duke of *Lenox* Forty Thousand Pounds to carry on the War against the Scots, *January 12* 1639

Prince Charles at the Age of twelve takes his Seat in Parliament - - - 1640

*London* refuses to lend the King 100,000 *l.*

Prince Henry his fourth Son born *July 20.*

*Scotch Army* enters *England.*

*Lesley* beats Lord *Conway* at *Newborn*, and the Scots make themselves Masters of *Newcastle*, *Durham*, &c. and seize the King's Magazines, *August 27, 28, and 29.*

The fatal long Parliament meet *November 3.*

*Alderman Pennington* with many hundred of the Citizens, petition against some Ceremonies of the Church; and the City supplies the *Scotch Army* with 100,000 *l.* - - - 1640

*Earl of Stafford* committed to the Tower.

*Archbishop Laud* impeached of High Treason and committed to the Black Rod.

The Commons vote 300,000 *l.* to supply the Scots.

*Bishop Laud* committed to the Tower *March 1.*

The Commons vote no Bishop should vote in Parliament, nor any Clergyman be in Commission of the Peace.

Princess *Mary* married to *William Nassau* - - - 1641

A Mob insult the King, crying out Justice! Justice! against *Stafford*, and he is condemned and beheaded on *Tower Hill May 12.*

Crosses and Figures, &c. taken out of Churches.

200,000 *English* massacred in *Ireland* by Sir *Philim O'Neal*, &c. without Distinction of Age or Sex.

Great Insults at *Whitehall* by a Mob of Watermen.—

The King with the Queen and Princess of *Orange*, go to *Dover*; he returns to *Greenwich*, they go to *Holland January 26.*

He is denied seeing the Prince of *Wales* and Duke of *York.*

The King's Magazines, Forts, Fleets, &c. seized *February 2.*

He flies to *York March 19.*

The Commons turn out the King's Admiral and chuse another.

The Commons obstruct all Levies, and oppose every Thing the King chuses.

The King goes to *Hull*, but is denied Admittance by Sir *John Hottham*. He declares *Hottham* a Traitor, but the Parliament clear him

1642

They raise 12,000 Militia in *Finsbury* Fields.

*Dover* Castle seized by the Parliament.

Earl of *Essex* with 15,000 at *Northampton* for the Parliament,

The Universities give the King their Plate.

The King releases the Prisoners he took at *Brentford*, on Condition never more to take up Arms; they swear Allegiance, but are absolved from the Oath by Dr. *Downing* and *Marshall*, (two Puritan Divines) and then take up Arms again, Nov. 15.

*Leeds*, *Doncaster*, and *Wakefield*, taken by the Rebels January 13.

The Queen lands in *Burlington* Bay in *Yorkshire*, with Money, Arms, and Ammunition, Feb. 28.

The Parliament vote a weekly Assessment of 34,808 *l.* for Maintenance of the Troops, March 23.

The Queen impeached of High Treason for assisting the King with Arms, &c. May 23

1643

Assembly of 118 Divines meet, having 4 s. a Day allowed them, in the *Jerusalem* Chamber.

The King and Queen meet July 13, at *Edgehill*, and go to *Oxford*.

The King, by Proclamation, prohibits all Trade and Commerce with *London*, October 17.

The two Houses make a new great Seal for all Patents, &c. and declare, that after May 22, 1642, the King's Seal shall be void, November 11.

The Rebels seize the Plate in *Westminster* Abbey, November 12.

The Scots invade *England* with 25,000 Men, Jan. 13.

Archbishop *Laud* tried at the Bar, March 12.

Scotch and English Army join under command of Lord *Fairfax*, April 20

1644

Prince's *Henrietta*, fourth and youngest Daughter, born at *Exeter*, June 16.

10,000 Royalists killed and taken Prisoners in the Battle at *Marston-Moor*, (by the Earl of *Manchester*, *Fairfax*, and *Lesley*) with all their Artillery, Arms, and Ammunition, 2d and 3d of July.

1500 Houses burnt at *Oxford*, October 6.

The Lords cannot condemn *Laud* of High Treason, but the Commons do, November 16.

The Lords terrified by the Commons attain of Archbishop *Laud*, and (notwithstanding he is pardoned

by

A.D.

- by the King) he is beheaded on *Tower Hill*, *January 10*, having first preached an extempore Sermon to the Spectators from *Heb. xiii. v. 2.* - 1644
- Fairfax* and *Cromwell* new model the Army; *Fairfax* being head, the other Lieutenant General in the Name (observe) and by Choice of the Parliament only, *April* - 1645
- Fairfax* defeats the King at *Naseby* in *Northamptonshire*, and takes all the Arms, Artillery, Ammunition, and his Cabinet Papers, *June 14*; and they are read in Parliament to the Commons, *June 23.*
- From *August 15*, to *March 15* following, four Cities and seventy-nine large Towns were taken by *Fairfax* and *Cromwell*; the chief were *Sherborn Castle*, *Basing*, *Langford*, and *Latham House*, *Belvoir*, and *Dartford Castle*.---Also *Carlisle*, *Chester*, *Langport*, *Pontfract*, *Bristol*, *Devizes*, *Hereford*, *Winchester*, *Torrington*, *Soltau*, &c.
- Lord *Asley* defeated at *Stow* in the *Wold*, and three thousand Men killed taken and dispersed, *March 21.* \*
- The King sends ten different Letters to the Parliament, from *December 4* to *March 24*, promising to disband his Forces, &c. if his Followers may have Liberty to live in Peace, &c.---But this is denied.
- Donnington Castle* surrenders, *March 25* - 1646
- From *April 7* to *June 20*, *Bamstable*, *Button*, *Cork*, and *Dudley Castles*, surrender; also *Oxford*, *Radnor*, and *Carnarvon*.
- The Duke of *York* (by Order) committed to the Care of the Earl of *Northumberland*, *June 23.*
- The great Seals broke to Pieces, *July 3.*
- Litchfield*, *Wallingford*, *Farringdon*, *Pendennis*, and *Island of Scily*, surrender, from *July 16* to *September 21.*
- Fairfax* returns to *London* in Triumph, *Nov. 12.*
- The Scots, for four hundred thousand Pounds, deliver the King up to the *English*, *January 30.*
- The King taken at *Holmby House* in *Northamptonshire*, by *Cornet Joyce*, *Feb. 16.*
- The Parliament quarrel and are divided; the Presbyterians being most powerful in the House, and the Independents in the Army, &c. - 1647
- The Parliament being jealous of the King's being in the Army, put the City in a Posture of Defence,

\* This was the last Army that appeared in the Field for the King.

A.D.

and vote that the Army remove forty Miles from  
*London, June 11*

1647

The Army marches to *London*, demolish all the Works  
in the City, and impeach eleven Members, *July 26*.

The King removed to *Hampton Court*, he is addressed by  
both Parties, (*September*) but cannot please either.

The King escapes to *Titchfield*; he trusts himself with  
*Hamond*, Governor of the *Isle of Wight*, who be-  
trays him to the Parliament, *Nov. 13*.

Four Bills sent to the King, but he cannot consent to  
pass them, *December 24*.

The Commons vote that no more Addresses be made  
to the King, *Jan. 3*.

The King made close Prisoner, *January 17*.

They make it High Treason for any one to deliver or  
receive a Letter or Message from him, without their  
Leave, *Feb. 15*.

Lord *Fairfax* died at *York*, *March 13*.

The Duke of *York* escapes to *Holland*, *April 22* - 1648

The *Welch* defeated by *Cromwell*, *May 8*.

Lord *Goring*, Lord *Capel*, Sir *Francis Lucas*, and the  
Royalists, march to *Colchester*, *June 6*.

*Colchester* invested by *Fairfax*, &c. *June 13*.

The *Scots*, under *Hamilton*, enter *England*, *July 13*.

Prince *Charles* seizes several Merchant Ships, and of-  
fers to release them for 20,000 *l*. *August 2*.

All that join with the Prince are voted Traitors.

*Cromwell's* Troops, after a bloody Engagement near  
*Preston*, rout Sir *Marmaduke Langdale* and Duke  
*Hamilton*, and the Duke is taken Prisoner at *Uxeter*  
with three thousand Horse, *August 17*.

*Colchester* surrenders after ten Weeks siege, *August 28*.

Sir *Charles Lucas* and Sir *George Lisle*, shot without  
Trial or settling their Affairs; and Lord *Goring*  
and *Capel* sent to *Windsor Castle*.

*Berwick* and *Carlisle* taken by *Cromwell*, *October 9*.

*Cromwell* returns to *London*, *November 20*.

Army quarters before *Whitehall* and *St. James's*,  
*December 2*.

The Army (by Colonel *Pride*) seizes forty-one Mem-  
bers going to the House, stops one hundred and  
sixty more, so that now there was but about one hun-  
dred and fifty to sit, and these mostly Officers,  
*December 6*.

A Detachment seizes all the Treasures at Goldsmith's  
Hall, *December 8*.

The

A.D.

The King brought from *Hurst Castle* to *Windsor*,  
*December 13*

1648

Voted that the Order of the Knee be omitted to the  
 King, *December 27*.

*Hugh Peters* humbly begs upon his Knees that Justice  
 may be done in the Execution of that *Barrabbas* at  
*Windsor*.

*Pritchard* the Royalist shot in *St. Paul's Church-yard*,  
 after he had peaceably surrendered *Pembroke Castle*  
 on Condition of Life, *Dec. 29*.

The Commons vote for bringing the King to Trial,  
 the Lords reject it, *Jan. 6*.

Serjeant *Dendy*, by Order of the Commons, proclaim  
 the intended Trial of the King with sound of  
 Trumpet, at *Westminster*, *Old Exchange*, and *Cheapside*,  
 for all Persons that had any Thing to alledge  
 against the King, *Jan. 9*.

An Order for a new *Great Seal*, with the Cross for  
*England*, and Harp for *Ireland*.—The Inscription  
 on one Side—*The Great Seal of England*—On the  
 reverse these Words—*In the first Year of our Free-*  
*dom, by God's Blessing restored 1648*.

*John Bradshaw* of *Gray's Inn*, made a President by the  
 Commons, to be one of the King's Judges, *Jan. 10*.

The King brought from *Windsor* to *St. James's*,  
*January 15*.

He is removed to *Sir Robert Cotton's House* at *Westminster*,  
 and thence carried three Times to their pre-  
 tended Court; but denying their Jurisdiction is de-  
 manded back to *Cotton's House*; and *Bradshaw* or-  
 dered this his Contempt to be registered, *Jan. 22*  
 and *23*.

The King brought a fourth Time, and *Bradshaw*  
 then made a Speech; after which the Clerk was or-  
 dered to read the Sentence; which contained a long  
 Preamble of a Series of Things laid to the King's  
 Charge (many of which were even then allowed to  
 be false) and ended thus—"For all which Treas-  
 ons and Crimes, this Court doth adjudge that  
 " he, the said *Charles Stuart*, as a Traitor, Mur-  
 " derer, and public Enemy, shall be put to Death  
 " by severing his Head from his Body, *Jan. 27*."

This horrid Act was perpetrated before *Whitehall* in  
 the open Street, about two in the Afternoon,  
*Jan. 30*; in the forty-ninth Year of the King's Age,  
 and twenty-fourth Year of his Reign.



His Issue was four Sons and five Daughters, viz.

1 *Charles James* (who died an Infant): 2 *Charles*, afterwards King. 3 *James*, afterwards King. 4 *Henry* Duke of *Glocester*. *Mary*, *Elizabeth*, *Anne*, *Catherine*, (who died young) and *Henrietta* - 1643

## TABLE XV.

## CHARLES II. King (by right).

*Charles I.* buried at *Windsor*, but allowed no Burial Service, Feb. 9.

Duke *Hamilton*, Earl of *Holland*, and Lord *Capel*, beheaded, March 9.

King *Charles* proclaimed in *Ireland*, March 19.

Alderman *Reynoldson*, Lord Mayor of *London*, imprisoned and fined Two thousand Pound, April 1 1649.

The Duke of *Glocester* and Princess *Elizabeth* allowed Two thousand Pound a Year, under the Tuition of the Countess of *Carlisle*, May 24.

An Act for the Sale of the Crown Lands, July 16.

*Cromwell* made Lord Lieutenant of *Ireland*, August 13.

*Cromwell* sets sail for *Ireland*, August 16.

He takes *Drogheda* by storm, puts three thousand to the Sword, and murdered Men, Women and Children, Sept. 14.

*Charles II.* arrives at *Jersey*, Sept. 19.

An Act passes to make Incest or Adultery capital for the first Offence, and Fornication for the second Offence, May 11 - - - 1650

The Marquis of *Montrose* hanged on a Gallows thirty Feet high, and afterwards quartered, and near fifty others of the best Families of that Kingdom were executed from May 20 to the 29th.

*Cromwell* returns from *Ireland*, is saluted with the Park Guns, and lodges in the Palace at *Whitehall*, May 31.

The King arrives at *Scotland*, June 23.

General *Fairfax* resigns his Commission, June 25.

*Cromwell* made General of all the Forces, with a Power of Alteration of all Officers as he thinks fit, June 26.

A great Plague in *Ireland*.

*Cromwell* sets out for *Scotland*, June 29.

Plague rages at *Shrewsbury*, July.

Dr. *Levens* a Civilian, hanged for having blank Commissions from the King about him, July 13.

The King proclaimed at *Edinburgh Cross*, July 15.

*Crom-*

- Cromwell* invades *Scotland*, *July 22* -
- Cromwell* kills three thousand *Scots* at *Dunbar*, takes nine thousand Prisoners with all their Colours, Ammunition, and two thousand Colours, and enters *Edinburgh*, *Sept. 3*.
- Princess *Elizabeth* died *Sept. 8*, in the fifteenth Year of her Age; buried at *Newport*.
- The Colours, &c. taken from the *Scots*, hung up in *Westminster Hall*, *Sept. 20*.
- Mr. *Benson* hanged for attempting to bring in his Majesty, *October 8*.
- Edinburgh* Castle surrenders to *Cromwell*, *Dec. 24*.
- The King proclaimed at *Barbadoes*, &c. &c. — His Standard is set up at *Aberdeen*, &c. — *Hamilton* made Lieutenant General, &c. *Jan. 1*.
- The Parliament of *England* order the King's Arms to be taken down in all Places, *Feb. 4*.
- The Quakers (under *George Fox*) first appeared.
- Cromwell* passes the *Frith*, and at *Fife* kills two thousand *Scots* and takes twelve hundred Prisoners, *July 1651*
- Charles II.* enters *England* by *Carlisle*, at the Head of sixteen thousand Men, and is proclaimed King, *August 6*.
- At *Worcester* the King's Forces are routed, three thousand killed, seven thousand taken Prisoners, with all the Cannon, Baggage, and Ammunition; Duke *Hamilton* was mortally wounded, *Sept. 3*.
- The King escapes to *Whiteladies*, twenty-five Miles from *Worcester*, and hides himself in an Oak.
- The Speaker of the House, &c. meets *Cromwell* at *Acton*, and conducts him to *London* in Triumph, *Sept. 12*.
- After six Weeks wandering from House to House under Disguise, the King arrives at *Foscan* near *Havre de Grace* in *France*, *Oct. 22*.
- Guernsey*, *Jersey*, *Scilly*, *Isle of Man*, *Limerick*, *Scotland*, *Barbadoes*, and *Virginia*, &c. submit to the Parliament from *Nov. 26* to *Jan. 11*.
- An Act passed for the Sale of the Estates of the Royalists, *August 4* - - -
- The Scaffolds of *St. Paul's* taken down to pay the Public Debts, *Sept. 28*.
- A Sea Fight in which *Blake* beats *De Wit* the Dutch Admiral, *Oct. 28*.
- Van Tromp* with eighty Sail, falls upon *Blake* (with forty Sail) in the *Downs*, destroys six of the En-

*gliss* and sailed in Triumph thro' the Channel,  
Nov. 29 - - -

1652

*Blake* beats *Van Tromp* off *Portland*, destroys eleven  
Dutch Men of War and thirty Merchant Men,  
Feb. 18, 19 and 20.

*Cromwell* goes to the House with a File of Mus-  
queteers, commands the Speaker to leave the Chair,  
telling them they had sat too long already, and told  
them they were no Parliament: *I say* (says he) *you*  
*are no Parliament.* He told *Sir Harry Vane* he was  
a juggler; called *Harry Martin* and *Sir Peter Went-*  
*worth*, Whoremasters; and *Tom Chalmoner*, a Drunk-  
ard, &c. &c. Then he bid one *Harrison* a Sol-  
dier, take away that Fool's Bauble, (*viz.* the  
Mace) and *Harrison* pulled the Speaker out of the  
Chair, and then *Cromwell* turned them all out of  
the House, locked the Doors, returned to *White-*  
*hall*; then went in the Afternoon to the Council  
of State, told them the Parliament was dissolved  
and they had no further Business, so dismissed them,  
April 20 - - -

1653.

General *Monk* with about ninety-eight Men of War  
engages *Van Tromp* (the Dutch Admiral) with one  
hundred and one Ships of War off the North Fore-  
land: The Fight lasted two Days, after which  
*Monk* took and sunk above twenty of the Enemies  
Ships, and pursued them to their own Harbours,  
June 2 and 3.

*Cromwell* sent one hundred and forty Persons to meet  
at *Whitehall*; they accordingly do it and choose  
*Bouse* for their Speaker, July 4 and 5.

The seventh and last Sea Fight between *Van Trump*,  
*Blake*, and *Monk*, in which thirty Dutch Men of War  
were sunk and taken, and *Van Tromp* killed, July 29.

Most of the Members in the old House resign to  
*Cromwell's* Power; but some few still continuing,  
Colonel *White* went and asked them what they sat  
for—They answered, *To seek the Lord*: Pish, says  
*White*, pray come out—the Lord has not been within  
the Walls of this House these twelve Years, Dec. 12.

A Revenue raised for maintaining ten thousand Horse  
and one hundred thousand Foot.

*Cromwell* proclaimed Lord PROTECTOR in *London*,  
*Westminster*, &c. &c. December.

*Vyner* Lord Mayor of *London*, with all the Companies  
meet the Protector on Horseback at *Temple Bar*;  
*Vyner* delivers the Sword to him, received it again

A. D.

- and carried it bare-headed before the Protector, in great Pomp, to Grocer's Hall, *Feb. 8.* - - - 1653
- The Queen of *Sweden* resigns her Crown, *May 30* 1654
- Debates in the House concerning the Legality of the Administration.—*Cromwell* comes and reprimands them, and near three hundred set their Hands not to alter it, *Sept. 12.*
- Voted that *Whitehall*, *St. James's*, the *Meuse*, *Somerset House*, *Greenwich*, *Hampton Court*, *Windsor*, and the Manor of *York*, be sold for the Protector's further Use and Support, *Dec. 20.*
- Dr. *James Usher*, Archbishop of *Armagh*, died *March 31* - - - 1655
- Jamaica* taken by Admiral *Penn*, *May 3.*
- Admiral *Blake* batters *Tunis*, destroys nine pirate Ships and releases the *English* Captives, *May 7.*
- Penn* and *Venables* sent to the Tower for their supposed ill Conduct against *Hispaniola* and *Domingo*, *September.*
- Cromwell* orders a Fast, and Collection for the persecuted Protestants in *France*, *Sept.*
- Manasseth Ben Israel* holds a Conference concerning the *Jews* being admitted to trade with *England*, *Dec.*
- Spain* declares War against *England*, *Feb. 16.*
- The *Spanish* Galoons destroyed near *Cadiz* by the *English*, and one taken worth two Million Sterling, *Sept. 8* - - - 1656
- Cromwell* gets a Bill passed for renouncing the pretended Title of *Charles Stuart*, *Sept. 26.*
- The Parliament desire *Cromwell* to be vested with the Title of King, *April 4* - - - 1657
- The Officers of the Army oppose *Cromwell's* accepting the Title and threaten him, *April 20.*
- Blake* burns every one of the *Spanish* Galoons in the *Canaries*, *April 27.*
- Dr. *William Harvey*, the first Discoverer of the Circulation of the Blood, died *July 30.*
- Blake* dies in his return from the *Canaries*, *August 17.*
- King *Charles II.* being now at *Bruges* creates Sir *Edward Hyde* Lord Chancellor of *England*, *Jan. 13.*
- John Hewett*, D. D. Sir *Henry Slingsby*, and the Hon. *John Mordaunt*, Esq; are brought before a Court of Justice for conspiring (as was pretended) against the Protector; Dr. *Hewett* and Sir *Henry Slingsby* are beheaded, and *Mordaunt* acquitted, *June 2 and 3* - - - 1658
- Cromwell* taken ill with a bad Fever, returns to *Whitehall*

A.D.

ball August 12, and died September 3; after being Protector four Years eight Months and eighteen Days; aged sixty

1658

An extraordinary high Wind the same Day Richard Cromwell was proclaimed Lord Protector, Sept. 4.

Oliver Cromwell buried with great Pomp in Henry VII's Chapel (after having first lain in State at Somerset House at sixty thousand Pounds Expence) Nov. 23.

Prince Henry (the King's Brother) created Duke of Gloucester, May 13

1659

Richard the Protector submits to the Rump or Remnant of Parliament, May 25.

Henry Cromwell submits to the Government of Ireland. The King removes from Brussels to Calais, Aug. 1.

A general Insurrection intended, but discovered, August 19.

Bradshaw (who condemned Charles I.) died of a Quartan Ague that held him a full Year, Oct. 31.

General Monk meets Lord Fairfax at York, and the Gentry with them declare for a free Parliament, Jan. 16.

Monk marches to London, takes up his Quarters at Whitehall, Feb. 4.

Monk is introduced to the Parliament House, makes a long Speech, desires no fanatical Party may have a Share or Choice in any Civil or Military Power, but begs the old secluded Members may be admitted, Feb. 6.

The Rump order Monk to destroy the Gates and Portcullies of London, which he executes Feb. 9.

Monk assembles his Force in Finsbury Fields, excuses what he had done to the City Gates, &c. dines with the Lord Mayor and Aldermen, &c. holds a Consultation with them: At last they drink the King's Health, &c. and Rumps are burnt in Bonfires all over London, Feb. 12.

The secluded Members take their Places, and vote Monk to be General of all the Forces in Great Britain and Ireland, Feb. 21.

Monk protests that he will oppose Charles Stuart, or the setting up of any single Person, Feb. 22.

The City congratulate the Restoration of the long Parliament, and lend them sixty thousand Pounds, Feb. 23.

Lambert committed to the Tower, March 6.

The Parliament dissolved by Act, having sat and con-

tinued



- tinued in various Forms nineteen Years four Months and thirteen Days, *March 16* - 1659
- Lambert* escapes out of the *Tower*, *April 9*, but is taken by *Ingoldby* at *Darventry*, *April 22* - 1660
- The King being at *Breda* sends a Message to Sir *John Greenville*, (or *Gran-vile*) which he delivers to the two Houses; and they vote the Government by a King, Lords and Commons, and grant at the same Time fifty thousand Pounds for his Majesty's Occasions, *May 1*.
- The City of *London* and the Fleet declare for his Majesty, *May 3*.
- The State Arms taken down at *Guildball*, and his Majesty's Statue set up, *May 7*.
- The King proclaimed in *London* and *Westminster*, *May 8*.
- The King proclaimed in *Ireland*, *May 14*.
- The King comes from *Breda* to the *Hague*, *May 16*.
- Six of the Lords and twelve of the Commons attend the King at the *Hague*, present him with the fifty thousand Pounds that had been voted for him, the Duke of *York* with ten thousand, and the Duke of *Glocester* with five thousand, *May 17*.
- A Deputation from the City at the same Time attend his Majesty, and present him with ten thousand Pounds, and all are knighted.
- The King lands at *Dover* and is received by General *Monk*, *May 25*.
- The King makes a triumphant Entry into the City of *London*, (being his Birth-Day) *May 29*.
- Duke of *York* made Lord High Chancellor of *England*, *June 1*.
- Duke of *York* re-marries Mrs. *Anne Hyde*, *Sept. 3*.
- Duke of *Glocester* dies of the Small Pox, *Sept. 15*, aged twenty-one.
- Dr. *Fuxon* (of *London*) made Archbishop of *Canterbury*, *Sept. 20*.
- Twenty-nine Regicides tried at the *Old Baily*, but ten only were executed, viz. *Thomas Harrison*, *John Carew*, *John Cook*, *Hugh Peters*, *Thomas Scot*, *Gregory Clement*, *Adrian Scroop*, *John Jones*, *Daniel Axtel*, and *Frances Hacker*, from the 10th to the 19th of *October*.
- Matthew Hale* made Lord Chief Baron of the *Exchequer*, *Nov. 7*.
- Francis Windham*, Esq; and Mr. *Lane*, are presented with one thousand Pound each, for their Service in preserving

preserving the King after the Battle of *Worcester*,  
*December 19* - - - - -

1660

*Mary* Princess of *Orange* died of the Small Pox,  
*Dec. 24*, and buried the 29th in *Henry VII's* Chapel.  
 The Earl of *Argyle* committed to *Edinburgh* Castle  
 for High Treason, *December 30*.

The Royal Society erected this Year and now established.

A Proclamation for ordaining the 30th of *January* as  
 a solemn Fast, *Jan. 25*.

A Conference at the *Savoy* between twelve Bishops  
 and twelve Dissenting Divines, in settling the Li-  
 thurgy, *March 25*. \*

1661.

Sixty-eight Knights of the Bath are created to attend his Ma-  
 jesty at his Coronation, *April 19*.

His Majesty is attended by the Nobility, Judges, &c. and  
 goes from the *Tower* to *Westminster*, *April 22*.

The Coronation solemnized with great Pomp by Archbishop  
*Juxon*, *April 23*.

A Convocation at *St. Paul's* confirming the present Liturgy,  
 adding thereto the two Forms of Prayer for the 30th of *Ja-  
 nuary* and the 29th of *May*, *May 8*.

All the Acts, or pretended Acts by *Oliver* against the *Stuart*  
 Family, burnt by the common Hangman in *Westminster Hall*,  
 in the Presence of the Court, *May 31*.

Twenty-one Regicides are brought to Justice; Lord *Moun-  
 son*, Sir *Henry Mildmay*, &c. were drawn with Ropes about  
 their Necks to *Tyburn* and back to the *Tower*, and there to re-  
 main Prisoners for Life, *July 12*.

The Parliament grant the King one Million two hundred  
 and sixty thousand Pounds, *December 20*.

*Elizabeth* Queen of *Bohemia*, eldest Daughter to King *James I*.  
 died in the sixty-sixth Year of her Age, and was buried in  
*Henry VII's* Chapel, *Feb. 13*.

A great Storm in *London*, *February 18*. †

1662.

*Miles Corbet*, *John Okey*, and *John Barkstead*, three Regi-  
 cides, sent over from *Holland* *April 16*, and executed the 19th.

\* There were one hundred and fifty-eight Barons created this Year,  
 from *April 2* to *March 20* following. See their Names in *Howell* and  
*Salmon*.

† There were sixty-seven Barons created this Year, from *March 26*  
 to *March 20* following. See their Names in *Howell* and *Salmon*.

Princess

Princess *Mary*, eldest Daughter to the Duke of *York*, (married afterwards to *William Henry Nassau Prince of Orange*) born *April 30*.

An Act that every Parson, Vicar, &c. should declare, subscribe, and consent to the Book of Common Prayer, *May 19*.

A Marriage between the King and the Infanta of *Portugal* is again solemnized at *Portsmouth*, by *Sheldon* Archbishop of *London*, *May 21*. Her Fortune was *Tangier* and the Island of *Bombay*, with two Million of Croisadoes; (*viz.* about

Sterling) and in Consideration of this she had thirty thousand Pounds *per Annum* settled upon her.

King *Charles* with his Queen arrives at *Hampton-Court*, *May 27*, and the Lord Mayor with the Aldermen attend them, and made the Queen a Present of a Purse of Gold.

Sir *Henry Vale* beheaded on *Tower Hill*, *June 6*.

St. *Jago* in the Island of *Cuba* demolished, *October 2*.

*Dunkirk* delivered to the *French*, *Oct. 17*.

Sir *Robert Hyde* made Lord Chief Justice, *Oct. 19*.

*Phillipps*, *Tonge*, *Gibbs*, and *Stubbs*, executed as Conspirators, *December 11*.

The King comes to the House and shews his Desire to indulge the Dissenters, but the Commons oppose it, *Feb. 27*. \*

1663.

An Address of both Houses to banish all Popish Priests and Jesuits, *April 1*.

*James* the Second, Son to his Royal Highness, born *July 12*, (died three Years after).

*John Twyne*, Printer, and *Thomas Brewster*, Bookseller, convicted for printing and publishing several treasonable Papers, and are imprisoned, *Feb. 15*. †

1664.

Sir *George Downing*, Embassador to the *States General*, presents a Memorial setting forth to them, that the *English* had sustained (at least) eight hundred thousand Pounds Damage by Depredations from the *Dutch*, and that Satisfaction was demanded, *June 11*.

The City lends his Majesty one hundred thousand Pounds to support the War against the *Dutch*, *June 21*.

The Lord Mayor attends his Majesty with a Second Loan of one hundred thousand Pounds, *Oct. 6*.

Both Houses return Thanks to the City for their kind Loans,

\* Barons created this Year, in Number twenty-six. See their Names in *Howell* and *Salmon*.

† Eighteen Barons created this Year. See their Names in *Salmon*.

### 38. THE YOUNG MAN'S

and vote the King a Supply of two Million and an Half, *November 25.*

His Royal Highness takes the *Dutch Bourdeaux Fleet* with others, consisting in all to one hundred and thirty Sail of Merchantmen, *Dec. 4.*

A blazing Star, (or Comet) *December 24.*

Lady Anne, second Daughter to the Duke of York, (afterwards Queen of England) born at *St. James's, Feb. 6.*

The Parliament again grant the King two Million four hundred seventy-seven thousand and fifty-six Pounds, to be paid at twelve quarterly Payments, (to commence from *December 25, 1664*) *March 4.* \*

1665.

The *Loyal London*, (a Ship) built by Subscription of the City, cost forty thousand Pounds, *May 10.*

George Fox (Father, or Leader of the Quakers) confined in *Scarborough-Castle, March 31.*

The Duke of York sails with one hundred and seven Men of War and fourteen Fire Ships, and arrives at the *Texel, April 28.*

The *English Fleet* returns, and the *Dutch* came out of Harbour and took the *Hamburg Fleet, May 4.*

A great Sea Fight off *Harwich*, the Duke took eighteen Capital Ships, destroyed fourteen more, and the *Dutch Admiral Opdam* was blown up. On our Side were killed the Earls of *Portland, Falmouth, and Marlborough*; Lord *Muskery*, Rear-Admiral *Sanfon*, and Admiral *Lawson, June 3.*

Thanksgiving for Victory over the *Dutch, June 30.*

The King and Court remove to *Salisbury* on Account of the Plague, *July 27.*

The Duke of York and his Family remove to *York* on Account of the Plague, *August 3.*

Fires made in the open Streets all over *London* for three Days and three Nights, in order to purify the Air.

The Commons vote the King one Million two hundred and fifty thousand Pounds, and grant the Duke of York fifty thousand more for his Service against the *Dutch.*

His Majesty returns from *Salisbury, Oxford, &c.* to *Hampton-Court, Jan. 17.* †

1666.

A severe Sea Fight by the Duke of *Albemarle* with fifty Ships, against ninety Sail of *Dutch*, commanded by *De Ruyter* and

\* Eighteen Barons created this Year; see their Names in *Salmon and Howell.*

† Eighteen Barons created this Year; see *Rapin* and *Salmon* for their Names.



*Trump*, who fought three Days, and the *Dutch* were joined by sixteen more, *June 1.*

Prince *Rupert* joined the Duke with thirty Sail, and the Fight was renewed with Obstinacy; neither Side had much Cause to boast of Victory, both Fleets retiring to their Harbours. Several thousands were killed on both Sides, and the *English* lost Sir *Christopher Mings* and Sir *William Berkeley*, Admirals, Sir *George Ascough* was taken Prisoner; and the *Dutch* lost Admiral *Everts*, *June 4.*

The *Dutch* again insult the *English* Coast and an Order is issued for drawing the Cattle from *Rumney-Marsh*, *June 30.*

*Charles*, third Son to the Duke of *York*, born at *St. James's*, *July 4.*

The *English* Fleet under Prince *Rupert* and the Duke of *York* put to Sea with a grand Fleet the 19th of *July*, and they meet the *Dutch* Fleet and engaged them on the 25th and 26th, destroying above twenty Men of War, and drove the rest into their Harbours. The *Dutch* lost in this Engagement four Admirals, and above four thousand Seamen.

Sir *Robert Holmes*, Rear-Admiral of the Red, destroyed two *Dutch* Men of War and about one hundred and fifty Sail of Merchant Ships in the *Uly*, and the next Day landed in the Isle of *Schelling*, and burnt near one thousand Houses in the Town of *Bandairs*, *August 8 and 9.*

The *Dutch* Fleet came out again and passed by *Dover*, but were again forced back by Prince *Rupert* with the Loss of five Men of War, *Sept. 1.*

The dreadful Fire of *London* (supposed to be done by the Papists, being on Fire in many Places at once) broke out in *Pudding-Lane* near where the Monument now stands. It burnt fiercely for three Days, and was not stopt till the 4th Day; in which Time were consumed the Cathedral of *St. Paul's*, eighty-eight Parish Churches, the *Royal Exchange*, *Custom-House*, *Guild-hall*, *Sion College*, with many excellent Structures, Hospitals, &c. &c. This Fire consumed near four hundred Streets; and the Number of Houses, according to the exactest Account, was thirteen thousand two hundred and eighty. It burnt from the Place it first began at to the *Tower*, extended also to the *Temple*, from thence to *Holborn-Bridge*, the Ground afterwards was measured and contained four hundred and thirty-six Acres, *September 2.*

A Proclamation for a general Fast on Account of the Fire, *October 10. \**

1667.

The *Dutch* sail up the *Medway*, at *Chatham* burnt the *Roya*.

\* Fifteen Baronets created this Year;



*Oak, Loyal London, and the Great James, with several other Men of War, June 11.*

*Edgar, fourth Son to the Duke of York, born June 14 (died 1671).*

*Sir John Harman with sixteen Sail of English Men of War beat the French with thirty Sail, near Martinico, June 25.*

*The Dutch Fleet forced out of the Mouth of the Thames by Sir Edward Spragge, July 23 and 24.*

*Cowley the famous Poet died July 28, buried in Westminster-Abbey, August 3.*

*The King laid the first Stone of the Foundation of the first Pillar of the Royal Exchange, Oct. 23, and the Duke of York the first Stone of the second Pillar, Oct. 31.*

*Both Houses desire the King to displace Lord Chancellor Clarendon: He is impeached of High Treason, Nov. 12; he goes to France, Nov. 30; they banish him by Act, December 19.*

1668.

*Bridge-Town in Barbadoes burnt down, April 23.*

*Princess Henrietta, third Daughter of the Duke of York, born at Whitehall, Jan. 13 (died Nov. 15, 1669)*

1669.

*Henrietta-Maria, Queen Dowager of Charles I. died at St. Colombe near Paris, Aug. 10, aged sixty, and buried at St. Dennis, Nov. 7.*

*The Royal Exchange first opened, Sept. 18.*

1670.

*Madame Queroualle came to England with Princess Henrietta, Dutchess of Orleans; (youngest Daughter to Charles I.) she is afterwards one of the Royal Concubines, and is made Dutchess of Portsmouth, May 15.*

*Henrietta dies, June 30, aged twenty-six.*

*The Duke of Ormond taken out of his Coach near Clarendon-House, by one Blood and his Confederates, (who afterwards stole the Crown) and wounded, but escaped being killed, December 6.*

*Princess Catharine, fourth Daughter to the Duke of York, born Feb. 9 (died Dec. 3, 1671).*

1671.

*Blood and his Confederates apprehended in attempting to carry off the Crown out of the Tower, May 9.*

*Sir Matthew Hale, Baron of the Exchequer, made Lord Chief Justice of the King's Bench, May 18.*

*The Dutch Smyrna Fleet met by the English, and five of them taken by Sir Robert Holmes, March 14.*

1672.

Forty Sail of *French* Men of War join the *English* at *St. Helens*, and the King went on board Count *Defree's* Ship, *May 4.*

A Fire at *St. Catharines* near Iron-Gate, which burnt one hundred and three Houses, *May 25.*

The *English* and *French* engage the *Dutch* in *Southwold Bay*, the Battle lasted a whole Day; several Thousands were lost on both Sides: The Earl of *Sandwich*, Admiral of the Blue, was blown up; the *French* lost their Rear-Admiral *De la Rabiniere*, and the *Dutch* lost Admiral *De Ghent*, *May 22.*

A new Conduit, erected by Sir *Thomas Viner*, was first opened; and (being his Majesty's Birth-Day) ran with Wine for several Hours, *May 29.*

*Tobago* in the *West Indies* taken from the *Dutch*, *Dec. 20.*

*St. Helena* (in *Africa*) taken from the *English* by the *Dutch*, *December 30.*

1673.

The Test Act passes the Royal Assent, viz. every Person before he received the Power of acting in any Civil or Military Capacity, was first obliged to take the Sacrament in the Church of *England*, *March 29.*

At the same Time an Act passed to grant his Majesty one Hundred twenty-three Thousand eight Hundred Pounds.

Prince *Rupert* takes the Command of the Fleet upon the Duke of *York's* Resignation, *April 9.*

Prince *Rupert* beats the *Dutch* and forces them into their Harbours, *April 28.*

Another Engagement, and the *Dutch* are driven from the Coast of *Suffolk* to their Harbours, *June 4.*

Prince *Rupert* gains a third Victory, Sir *Edward Spragge*, Admiral of the Blue, was killed on the *English* Side; the *Dutch* lost several brave Officers and about eleven Hundred Men, *August 11.*

Sir *Thomas Osborn* created Lord High Treasurer, *Aug. 15.*

His Majesty addresses for Supplies, but the Commons vote against them, till the Duke of *York* lays aside the Thoughts of marrying the Princess of *Modena*, and they can be more secured against Popery, *August 17.*

An Order of Council that no Papist, or reputed Papist, attempt to come to Court, *June 14.*

The Princess of *Modena* lands at *Dover*, is met there by the Duke of *York*, and married that Evening by the Bishop of *Oxford*, *June 21.*

1674.

*George Fitz-Roy*, third natural Son to King *Charles II.* (by the

the Dutchess of *Cleveland*) created Earl of *Northumberland*, Viscount *Falmouth*, and Baron of *Pontefract*, *October 31*.

Four *Tripoli* Men of War burnt in the Port of *Tripoli*, by Sir *John Narborough*, *March 4*.

In the *Tower* of *London* (under a Pair of Stairs) were found two Human Bodies, which, by all Appearances, appeared to be those of *Edward V.* and his Brother *Richard*, (who were murdered by their Uncle *Richard III.* in 1483) which were interred in *Westminster Abbey*, *March 16*.

1675.

A great Hurricane in *Barbadoes*, in which about three Hundred Houses, and above two Hundred Persons were destroyed, and eight Ships in the Road or Harbour, *August 10*.

*Dr. Henry Compton*, Bishop of *London*, sworn of the Privy-Council, *Jan. 22*.

1676.

The King and Queen with their Royal Highnesses the Princesses *Mary* and *Anne*, were elegantly entertained at the Lord Mayor's Feast, *Oct. 29*.

1677.

The Sum of six Hundred Thousand Pounds required by his Majesty to secure the *Netherlands*, *March 30*.

An Act granting five Hundred eighty-four Thousand nine Hundred seventy-eight Pounds to build thirty Ships of War, *April 16*.

Princess *Mary* married to the Prince of *Orange* at *St. James's*, *November 4*.

*Charles*, second Son of the Duke of *York* by his second Dutchess, born at *St. James's* *Nov. 7*, died the 12th of *December* following.

*Dr. Gilbert Sheldon*, Archbishop of *Canterbury*, died *Nov. 9*.

*Dr. William Sancroft*, Dean of *St. Paul's*, consecrated Archbishop of *Canterbury*.

The Commons vote the Sum of seventy Thousand Pounds to erect a Monument for King *Charles I.* and for solemnizing the Funeral.

1678.

A general Fast, *April 10*.

An Act for burying in Wool, *July 15*.

*Dr. Tongue*, a Physician, reports a Conspiracy against the King's Life and the Protestant Religion, by the Jesuits, *August 11*.

*Dr. Tongue* and *Thomas Oates* make Oath of the Truth of the Plot against the King before Sir *Edmundbury Godfrey*, *September 6*.

Dr,

Dr. *Tongue* and Mr. *Oates* attend the Council, and after Examination are ordered to *Whitehall*, and Guards over them, *Sept. 28.*

*George Wakeman* the Queen's Physician, Mr. *Coleman* Secretary to the Duke of *York*, and Mr. *Langborne* a Counsellor in the *Temple*, are taken up for the Conspiracy aforementioned; together with *Thomas Whitebread* a Jesuit, and *Gavan, Turner, Wyn, Ireland, Marshall, Rumsey, Corker, and Pickering*, Popish Priests, *Sept. 30.*

Sir *Edmundbury Godfrey* found murdered near *Hampstead*, having been strangled and then run through with his own Sword, *Oct. 17.*

A Proclamation issued the Reward of One Hundred Pounds who should discover the Murderers, *Oct. 20.*

*Oates* examined by the Lords and Commons concerning the Plot (mentioned before); he impeaches *William Earl of Powis, William Viscount Stafford, Henry Lord Arundel of Wardour, William Lord Petre, John Lord Bellasis, and Sir Henry Titchborne*, who all surrender and are committed to the *Tower*, *October 25.*

A Proclamation to apprehend all Popish Recusants in the Guards, the Parliament also resolve that there is a hellish Plot on Foot to assassinate the King and subvert the Protestant Religion, *October 31.*

A Dispute arises in the House concerning excluding the Duke of *York* from succeeding to the Crown, *Nov. 4.*

*William Bedloe* (Servant to Lord *Bellasis*) becomes Evidence concerning the Plot and the Murderers of Messrs. *Price, Vaughan, Thimelby, Spalding, Wintour, James, and Milbourn*, ordered into Custody by *Bedloe's Oath*, and a Proclamation is issued for apprehending *Le Phair, Pritchard, Symonds, Waisb, Conyen, and Beeston*, charged with the same Conspiracy; also a Reward issued promising Twenty Pounds for the Discovery of every Jesuit, *Nov. 12 to 17.*

*William Staley* a Goldsmith hanged at *Tyburn* for saying he himself would kill the King, *Nov. 21.*

A Proclamation offering Two Hundred Pounds Reward for any Person concerned in the Popish Plot to make for the Discovery and his Pardon, *Nov. 28.*

*Oates* and *Bedloe* charge the Queen in the Plot of Conspiracy, whereupon the Commons address the King, that the Queen and all the Royal Family be removed from *Whitehall*, with the Duke of *York* and all reputed Papists, *Nov. 30.*

The King resents *Oates's* Insolence and sets a Guard over him; but the Commons address his Majesty that he may be freed, *December 7.*

*Ireland, Grove and Pickering* convicted in the Plot (executed 1679) *December 17.*

*Titus*



*Titus Oates* allowed Ten Pounds per Week and yet petitions for greater Allowance, *Jan. 4.*

A remarkable Darknes about Noon that one could not see to read; the Causes of which never were yet discovered, (See *Clarendon, Goodwin, Howell, Thomsonand, and Salmon*) *January 12.*

*Green, Berry, and Hill*, executed for the Murder of Sir *Edmundbury Godfrey*, (but deny it to the last) *Feb. 10.*

The Duke of *York* and his Family, by desire of the King, embark for *Flanders*, and resides at *Brussels*, *Feb. 28.*

*Oates* charges Sir *John Robinson*, Colonel *Edward Sackville*, Captain *Henry Goring*, Members of the House of Commons, and the Earl of *Danby* with the Plot, and the Earl absconds, *March 20 and 21.*

The King grants the Earl of *Danby* a Pardon, and the Commons resolve an Address against the Illegality of it, *March 23.*

1679.

The Commons send after the Earl of *Danby* but cannot apprehend him; they therefore order a Bill to attain him if he does not appear before the 21st of *April*, *March 26.*

The five Popish Lords in the *Tower* impeached, *Apr. 4.*

The Earl of *Danby* surrenders himself and is committed to the *Tower*, *Apr. 21.*

*Reading* the Counsellor convicted at the King's Bench for trying to bias *Bedloe* and other Evidences, in order to conceal the Plot, he was also fined one thousand Pounds, ordered to be imprisoned one Year, and stood in the Pillory in the Palace-Yard, *Apr. 24.*

The Commons resolve that the Duke of *York*, being a Papist, occasioned all these Troubles and Conspiracies, in Hopes of succeeding to the Crown; and they order Lord *Ruffel* to carry the Votes to the House of Lords for their Concurrence, *Apr. 27.*

The Commons order a Bill to disable the Duke of *York* to succeed to the Crown, *May 15.*

*Thomas Whitebread*, Provincial of the Jesuits, with *Harcourt, Fenwick, Gavan* and *Turner*, tried and convicted at the *Old Baily* of High Treason, in conspiring the King's Death, and subverting the Protestant Religion, (and are executed the 21st) *June 18.*

*Richard Langborne*, Esq; Counsellor, convicted of High Treason, as being concerned in the Plot, and is executed, *July 14.*

The King being extremely ill the Duke of *York* arrives from *Flanders*, *Sept. 2.*

The King being much better the Duke of *York* returns to *Flanders*, *Sept. 26.*

Their Royal Highnesses, with the Princess *Anne*, arrives at *Whitehall* from *Flanders*, *Oct. 12.*

Thomas



*Thomas Dangerfield* examined before the Council concerning the Plot, (called now the *Meal-Tub Plot*) and charges several Lords (called then Whigs) of Things against the Government, *October 23.*

*Dangerfield* committed for High Treason, *Oct. 27.*

The Earl of *Castlemain*, and the Countess of *Porwis*, committed to the *Tower* on *Dangerfield's* Oath, and several other Gentlemen were committed to different Prisons on the same Evidence, *Nov. 2* and *4.*

The King declared in Council he would send for the Duke of *York*, *Jan. 28.*

The Duke of *York* arrives, and the King and the Duke, &c. are grandly entertained by Sir *Robert Clayton*, Lord-Mayor, at his House in the *Old Jury*, *March 8.*

1680.

A Proclamation prohibiting the printing of News-Papers and Pamphlets, *May 16.*

*Bedloe* dies at *Bristol*, but declares upon his dying Bed, to Lord Chief Justice *North*, that the Queen and the Duke of *York* were actually concerned in the whole Plot, except murdering the King, *August 20.*

A Proclamation for a further Discovery of the Plot, and for disabling *James Duke of York* to succeed to the Crown, *October 30, 31, and Nov. 2.*

The King sends the Commons a Message that they shall be secured from Popery, but cannot consent to alter the Succession; however, an Act takes Place to disable the Duke of *York*, *November 10.*

Lord *Stafford* convicted of High Treason and beheaded, *December 29.*

The Parliament being prorogued, Sir *Pakine Ward* (then Lord-Mayor) with the Commons petitioned his Majesty that they might be forthwith recalled, and sit again, *Jan. 13.*

The Parliament by Proclamation dissolved, and another ordered to meet at *Oxford*, (*March 21*) *Jan. 18.*

The Duke of *Monmouth*, Earls of *Bedford* and *Essex*, with many other Noblemen, petition his Majesty not to have a Parliament at *Oxford*, *Jan. 26.*

*Edward Fitz-Harris* committed to *Newgate*, *Feb. 28*, for a Libel against the King, and he is committed to the *Tower*, *March 11.*

His Majesty and the Court set out for *Oxford*, and the Parliament met, many Members of which set out from *London* with a numerous Body, having in their Hats Ribbons with this Inscription, *No Popery, no Slavery.*

1681.

1681.

His Majesty constitutes the Duke of York High Commissioner of Scotland, and to be his Representative there, *June 22.*

Dr. Oliver Plunket, titular Primate of Ireland, and Edward Fitz-Harris, Esq; executed at Tyburn for High Treason, *July 1.*

Anthony Earl of Shaftsbury committed to the Tower for High Treason, Papers having been found upon him for excluding the Duke of York, *July 2.*

The famous Titus Oates turned out of his Lodgings at Whitehall and discharged.

The Earl of Shaftsbury tried at the Old Baily for attempting to exclude the Duke of York, but the Grand Jury bring it in *ignoramus*, *Nov. 24.*

Symphon Tongue, son of Dr. Tongue, plainly proves that his Father and Titus Oates first contrived the Plot, *Jan. 2.*

The Duke of York's Picture torn to Pieces in Guildball, and the Lord-Mayor and Court of Aldermen offer five hundred Pounds Reward for the Discovery of any of the Offenders, *January 25.*

The King and Court go down to Newmarket, and the Duke of York meets them there, *March 11.*

1682.

The Lord-Mayor and Aldermen attend his Majesty, and congratulate him and the Duke of York upon their Return from Newmarket, *April 10.*

The Duke of York embarks for Scotland in the Gloucester Frigate, which was lost upon the Sands called the Lemon Oar, about sixteen Leagues and a Half from the Humber; almost all the Crew perished, but the Duke and Mr. Churchill (afterwards Duke of Marlborough) arrived in Scotland, *May 7.*

A Fire at Wapping which burnt above three hundred and twenty Houses, *Nov. 22.*

Prince Rupert died at Spring Gardens, *Nov. 29*, and buried in Henry VII's Chapel in Westminster Abby, *Dec. 6.*

A large Fire broke out at Newmarket (while the King and Duke of York were there) which consumed near half the Town; the King returned much sooner than he intended, and thereby escaped being assassinated at the Ryehouse by one Rumbold and his Confederates, *March 22.*

1683.

The Plot for assassinating the King at Ryehouse in Hertfordshire discovered, and a Proclamation is issued for apprehending Rumsey, Rumbold, Nelthorp, Rouse, Wade, Goodenough, Walcot, Thompson, Burton, and Hone, the Conspirators, offering one hundred Pounds for each, *June 12 and 23.*

William

*William Lord Russel*, and the Earl of *Essex*, with *Walcot*, *Hone*, and *Rouse*, are convicted of High Treason, and sentenced to Death, July 13.

*Walcot*, *Hone*, and *Rouse* executed at Tyburn, and confessed the Fact; but *Walcot* denied that Part of the Charge relating to the assassinating of the King, July 20.

The Earl of *Essex* cuts his Throat in the Tower, but *William Lord Russel* was beheaded in *Lincoln's-Inn Fields*, July 21.

A Thanksgiving for his Majesty's Delivery from the *Ryehouse Plot*, July 28.

The Princess *Anne* was married at St. James's to Prince George of Denmark, July 28.

The Turks lose at the Siege of *Vienna* seventy thousand Men, Sept. 12.

The Duke of York and George Prince of Denmark, entertained by the Artillery Company at Merchant-Taylors Hall, Nov. 8.

*Algernon Sidney* convicted in being in the Plot, and was condemned, Nov. 26.

*Algernon Sidney* beheaded on Tower-Hill, Dec. 7.

The Duke of Monmouth convicted, he owns he was concerned in the Plot, (except that relating to the King's Life) therefore his Majesty pardons him, Dec. 25.

Sir *Samuel Barnardiston* convicted of Misdemeanour in railing against the Government, and asserting that Lord *Russel* was not fairly dealt with, &c. He was fined ten thousand Pounds, and obliged to find two able Securities for his good Behaviour during Life, Feb. 14.

1684.

The Duke of York brought an Action against *James Dutton*, Esq; for asserting that the Duke was a Papist; and saying he would be hanged at his own Door before such a damned popish Rascal should inherit the Crown, &c. He was convicted, and the Judge gave the Duke ten thousand Pounds Damages, May 3.

*Francis Smith*, Bookseller in Cornhill, convicted for publishing a seditious Libel on the King, the Duke, and the whole Administration, (called the *Raree Show*) for which he was fined five hundred Pounds, and sentenced to stand in the Pillory three Times, June 11.

*Titus Oates* fined ten thousand Pounds for calling the Duke of York a Traitor, a Son of a Whore, &c. and hoped he should live to see him hanged, June 18.

Sir *Thomas Armstrong* being out-lawed on Account of the *Ryehouse Plot*, he was apprehended at *Leyden* and sent over to England, and was brought to the King's Bench Bar, and was executed; his Head was set up at *Westminster Hall*, between

*Cromwell's and Bradshaw's, and his Quarters on the City Gates, June 20.*

The King died at *Whitehall* in the fifty-fifth Year of his Age and the thirty-seventh Year of his Reign; he was buried in *Westminster Abbey*. He had but one Wife who was *Katherine Infanta of Portugal*, who survived him many Years; he had no Issue by her, but had a numerous Issue by others.

## TABLE XVI.

1684.

JAMES II. the third and only surviving Son of *Charles I.* being proclaimed King immediately upon the Death of his Brother, he made a very formal and specious Speech in Council, promising, that tho' he had been represented and reported as a Papist, yet they should see that he never would pretend to invade any Man's Property in Church or State \*, *Feb. 6.*

*Sir George Jefferies* made Lord Chief Justice of the King's Bench, *Feb. 7.*

The King went publickly to mass at St. *James's Chapel*, *February 8.*

King *Charles II.* buried privately (from the painted Chamber) in *Henry VIIIth's Chapel*, *Feb. 14.*

The King found two Papers of the late King's in his strong Box, he publishes them to manifest to the World that he really died a Papist, *Feb. 18.*

1685.

The Parliament of *Scotland* meet, and the Duke of *Queensborough* made a Speech, wherein he assures them of his Majesty's Protection in their Religion and Liberty, *March 28.*

The King and Queen crowned at *Westminster* by Archbishop *Sandcroft*.

*Titus Oates* by Numbers of Witneses, and by several sufficient Proofs, is found guilty of Perjury by two different Indictments. On the first Indictment he was to pay one thousand Marks, and to be stript of his canonical Habit, that he should stand in the Pillory before *Westminster-Hall Gate*, with a Paper over his Head declaring the Crime; and for the second Indictment the Judgment was, that he should stand in the Pillory the *Thursday* following at the *Royal Exchange*; the *Wednesday* following he was to be whipt from *Aldgate* to *Newgate*, and on *Friday* from *Newgate* to *Tyburn*; and that on

\* How far the King kept his solemn Promise in this respect every History plainly shews: And 'tis evident that no King can be a good King in *England* while he leans to, or is influenced by the persecuting Spirit and Principles of the Church of *Rome*.

the



the 9th of *August* every Year of his Life, he should stand in the Pillory before *Westminster-Hall Gate*; on the 10th at *Charing-Cross*, on the 11th over against the *Temple*, on the 2d of *September* at the *Royal Exchange*, and on the 24th of *April* at *Tyburn*, *May 8, 9 and 11.*

*Thomas Dangerfield* sentenced to stand in the Pillory for a Libel, and to be whipt from *Aldgate* to *Newgate* one Day, and from *Newgate* to *Tyburn* another Day, and to pay one hundred Pounds, *May 30.*

*Mr. Richard Baxter* indicted and brought to Trial at the King's Bench Bar, for a scandalous Libel called a *Paraphrase on the New Testament*, &c. in which were several Things reflecting upon the Conduct of the Clergy, &c. He was fined five hundred Marks, and to give good Security for his good Behaviour for seven Years, *May 30.*

*Princess Anne of Denmark* brought to bed of a Daughter, christened *Mary*, (who died in *February 1686*) *June 1.*

*Thomas Dangerfield* having gone through his last Punishment of being whipped, in returning from *Tyburn* to *Newgate* in a Coach was met by Barrister *Frances*, of *Gray's-Inn*, by *Gray's-Inn Gate*, who ran up to the Coach and reproachfully scoffed at him for what he had suffered; upon which *Dangerfield* spit in his Face, and *Frances* in Revenge pushed the End of his Cane into his Eye, of which Agony *Dangerfield*, about five Hours after, died.—*Frances* was fully convicted of the Fact, and was executed for it, *June 3.*

The Duke of *Monmouth* proclaimed King at *Taunton*, *June 20.*

A Proclamation offering five hundred Pounds to take the Duke of *Monmouth*, dead or alive, *June 15.*—*Monmouth* offers the same for King *James's Head*, *June 22.*

*Rumbold* the Maister, executed for the *Ryehouse Plot* on the late King, *June 26.*

The Duke of *Argyle* beheaded at *Edinburgh*, *June 30.*

The Duke of *Monmouth* defeated by the Earl of *Feversham* and Lord *Churchill*, near *Bridge-water*, *July 6.*

*Monmouth* beheaded on *Tower-hill* in the thirty-sixth Year of his Age.—He said *He was content, being sure he should go to God in fighting against Popery*, &c. *July 15.*

The Earl of *Stamford*, Lord *Brandon*, and the famous (or rather infamous) Judge *Jefferies* \*, went down to try several Rebel

\* Among the Records of History we shall find few equal to this wicked *Jefferies*; for not only this inhuman Dealing with *Mrs. Lisle*, &c. he caused also twenty-nine innocent Persons to be executed at *Dorchester*; upwards of eighty at *Exeter*. He condemned in all above five hundred Persons, about two hundred and forty of which were executed, and even their Quarters were ordered to be set up in the most principal Places and Roads; delighted, as it were, in the most un-



Rebel Prisoners at *Winchester*; at which Time he condemned Mrs. *Lisle*, Widow of Judge *Lisle* (one of King *Charles's* Judges), for harbouring one *John Hicks* a Non-conformist: She was sentenced to be burnt; but this was altered, and she was beheaded at *Winchester*, Sept. 2.

*Jefferies* (being famous for persecuting and condemning all that were really true Protestants) is made Lord High Chancellor of England, Sept. 28.

*Henry Cornish*, Esq; and Alderman, (a Gentleman of untainted Character) was hang'd and quarter'd in *Cheapside*. *Ring* and *Fernby* were also hang'd and quarter'd at *Tyburn*, and Mrs. *Gai.* was burnt for High Treason in harbouring several Persons in *Monmouth's* Rebellion, Oct. 19 and 23.

The Commons vote his Majesty seven hundred thousand Pounds, and yet he would not release the Earl of *Stamford* and Lord *Delamere* from Imprisonment, but rashly prorogues the Parliament till Feb. 10. Nov. 20.

*Charles Bateman*, a Surgeon, convicted of being a Traitor to the late King, and executed at *Tyburn*, Dec. 18.

1686.

Sir *Christopher Milton*, a Roman Catholick, made a Baron of the Exchequer, Apr. 26.

The French Ambassador complains to the King of a scandalous Libel in Favour of the Protestants, May 8.

The King sends a Letter to the Bishop of *London* to suspend Dr. *John Sharp* for some unbecoming Reflections in his Sermon, May 14.

The Earl of *Porwis*, Lord *Arundel*, Lord *Bellasis*, and Lord *Dover*, (noted Roman Catholicks) all sworn of the Privy-Council, May 17.

The Ecclesiastical Commission opened, and directed to the

heard-of cruel, unmanly, and detestable Barbarities: Nor was he altogether alone, for that infamous Wretch Colonel *Kirk* was not far behind him; for at *Taunton* he caused near one hundred Men to be hang'd, and some quarter'd, with Drums and Pipes beating and playing, and he sporting at their Execution. But one Thing must not be omitted.—A young Woman, Sister to one that was condemned, threw herself at *Kirk's* Feet imploring a Pardon; he took her aside and promised her, that her Petition should be granted if she would prostitute herself to him: Her Love was so great, and being scarcely in her Senses, she (innocently) complies with his cursed Demands, but after having gained his Point by debauching her, he had the Inhumanity to take her to a Window and shewed her her Brother hanging upon the Sign-Post of the House where he himself quartered.—This took such an Effect of her that she died distracted. Such were the Followers, Abettors, and just Judges in King *James's* Reign. See *Voltaire*, *Rapin*, *Howell*, *Bennet* and *Salmon*.

Arch-

Archbishop of *Canterbury*, Lord Chancellor *Jefferies*, the Bishops of *Durham* and *Rocheſter*; the Earl of *Rocheſter*, Earl of *Sunderland*, and Lord Chief Juſtice *Herbert*, or any three of them, but *Jefferies* the Chancellor was to be one to make a Quorum.—But the Archbishop never acted, and the Biſhop of *Rocheſter* declined, *Auguſt 3*.

The Biſhop of *London* ſummoned by the Commiſſioners to appear before them, relating to Dr. *Sharp*, &c. *Auguſt 4*.

*Buda* (Capital of *Hungary*) taken by the *Imperialiſts* after having been in Poſſeſſion of the *Turks* near one hundred and forty-fix Years, *Auguſt 23*.

The Biſhop of *London* ſuſpended, *Sept. 28*.

Colonel *Richard Talbot* (a Roman Catholick) created Earl of *Tyrconnel*, and ſworn of the Privy-Council, *Oct. 8*.

The Rev. Mr. *Samuel Johnson* (Chaplain to the late Lord *Ruffel*) convicted for writing a Pamphlet entitled—*An Addreſs to the Engliſh Proteſtants*, and adviſing them to take Care not to be led aſide by Popery, &c.—He was for this ſentenced to ſtand three Times in the Pillory, to pay a Fine of three hundred Marks, and to be whipt from *Newgate* to *Tyburn*; but even after this Sentence he was degraded before the Commiſſion in high Form, and then, without regard to his Function, delivered as a common Felon to the Secular Officer, *Nov. 20*.

The White Staff taken from the Earl of *Rocheſter* becauſe he adhered to the Proteſtant Intereſt, *Dec. 2*.

The King ſends a Letter to the Univerſity of *Cambridge* to admit *Alban Francis*, a Benediſt Monk, to be Maſter of Arts, without the common Order, and without the Oath required; but they reſuſe him, *Feb. 9*.

*James Fitz-James*, natural Son to King *James II.* by Mrs. *Churchill*, created Duke of *Berwick*, Earl of *Falmouth*, and Baron of *Boſworth*, *March 19*.

1687.

The King publiſhes a Declaration for Liberty of Conſcience to all Sects, *Apr. 4*.

The King receives Addreſſes of Thanks from the Proteſtants in general, in this Indulgence, and Anabaptiſts, Quakers, Independents, and Preſbyterians, daily preſented their hearty and loyal Thanks, *Apr. 4 to 7*.

The King ſends his Mandate to *Magdalene College Oxon*, to elect Mr. *Anthony Farmer* (a Roman Catholick) their Preſident, *Apr. 11*.

Sir *Richard Ailibon* (a Papiſt) made a Juſtice of the King's Bench, *May 5*.

The Vice-Preſident of *Magdelene College* cited to appear before the Commiſſioners at *Whitehall*, to give reaſons why they reſuſed to elect Mr. *Farmer* their Preſident, *May 28*.

The Commissioners suspend Dr. *Aldworth* from being Vice-President, declare one *Hough* President, and suspend also Dr. *Fairfax* from his Fellowship for their Contempt in not electing Mr. *Farmer* President, *June 22.*

The Parliament dissolved by Proclamation, *July 2.*

The Pope's Nuncio (Signior *Ferdinando d'Adda*) admitted to an Audience to their Majesties at *Windsor*, *July 3.*

The King sends a second Mandate to *Magdalen* College to elect the Bishop of *Oxford* President, but they refuse. *Aug. 24.*

The King goes in Person to *Oxford*, threatens the Fellows with Suspension, and by the Commissioners, Sentence of Expulsion was pronounced against them (the 16th of *November* following) in Form, *Sept. 4.*

The Pope's Nuncio, a *French* Embassador, and many other Foreign Ministers, entertained at the Lord-Mayor's Feast at *Guildhall*, *Oct. 29.*

Father *Edward Petre*, a Jesuit, sworn of the Privy-Council, *November 11.*

1688.

An Order of Council was published commanding, that the Declaration of the 27th of *April 1687*, against the University of *Cambridge*, should be printed, and read in the Time of Divine Service in all Churches and Chapels in *London* and *Westminster* and ten Miles round, and in all Churches and Chapels in *England* the 3d and 10th of *June*, *May 2.*

The Archbishop of *Canterbury*, the Bishop of *St. Asaph*, *Ely*, *Chichester*, *Bath*, *Wells*, *Peterborough*, and *Bristol*, present a Petition to his Majesty, desiring him to dispense with the distributing and reading the said Declaration, *May 18.*

The Bishops sent to the *Tower* for presenting the Petition, (called a Libel) and they were most scandalously sent by Water, *June 8.*

The seven Bishops brought to Trial to the King's Bench Bar, and appeared from Day to Day till legally discharged, *June 16*; and they appeared again, and after a long Trial the Jury brought them in not guilty, which occasioned great Rejoicings, not only in *London* but even the Camp at *Hounslow Heath*. The King also having ordered Masts on Board the Fleet, there was a great Mutiny, and several Priests were in Danger of being thrown over-board, *June 29.*

The Ecclesiastical Commissioners issue out an Order to all Chancellors, &c. in *England*, to inquire into, and return the Names of all such who had, or had not publicly read the Declaration; which caused great Disturbances, *July 6.*

*James* Duke of *Ormond* died, aged seventy-nine, *July 11.*

Prince of *Wales* christened by the Name of *James Francis*  
*Edward*

*Edward*, his Holiness, by Proxy of his Nuncio, being God-father, *Oct. 15.*

The Prince of *Orange* sets sail from *Holland* with fifty Men of War, and nearly fifteen thousand Land Forces in three hundred Transports, with the Earls of *Shrewsbury* and *Macclesfield*, but are driven back by a Storm, *Oct. 19.*

The Prince of *Orange* lands at *Torbay*, *Nov. 1.*

The King charges the Bishops of their inviting the Prince of *Orange* over.

The Prince of *Orange* arrives at *Exeter*, *Nov. 8.*

Lord *Cornbury*, Lord *Churchill*, the Duke of *Grafton*, and many other Lords join the Prince of *Orange*, *Nov. 22.*

The Prince of *Denmark* and the Duke of *Ormond* desert the King, *Nov. 24.*

The Queen and the young Prince embark for *France*, *Dec. 9.*

The King sends Orders to the Earl of *Fewersham* to disband the Army, and takes Water at *Whitehall* Stairs for *France*, *December 10.*

Several Mass Houses with a Number of Houses of Roman Catholics, and the *Spanish* Ambassador's House, are pulled down or damaged by a Mob, *Dec. 12.*

Lord Chancellor *Jefferies* taken in Disguise in *Wapping*; he is sent to the *Tower*, and in a short time after dies there, *Dec. 13.*

The King driven back by a Storm to *Fewersham*, he is taken for a Jesuit, and abused, *Dec. 14.*

The Prince of *Orange* arrives at *Windsor*.

The King returns to *Whitehall*, *Dec. 16.*

The Prince of *Orange*'s Forces take Possession of the Posts at *Whitehall*, and at Midnight the Prince sent Word for the King to remove, (in Order to save his Person) and he went to *Rochester* under a *Dutch* Guard, *Dec. 17.*

The Prince of *Orange* issues a Declaration for all Officers, Magistrates, &c. to keep their places (except Papists) till further Orders, *Dec. 30.*

Dr. *Seth*, Bishop of *Sarum*, died, *Jan. 6.*

The City of *London* raise the Prince two hundred thousand Pounds in four Days Time; Sir *Samuel Dashwood* subscribing sixty thousand Pounds himself.

The Archbishop, and seven other Bishops, sign the Association, *Jan. 16.*

The Commons resolve, that as King *James II.* had tried to subvert the Constitution, breaking his own Contract as King, and being led aside by Jesuits and other such wicked Men, and having abdicated the Crown, that the Throne is thereby declared vacant, *Jan. 31.*

The Lords agree to the same, *Feb. 2.*

King *James II.* reigned three Years nine Months and eleven Days, the Throne vacant two Months and three Days.



The Princess of *Orange* arrives at *Whitehall*, Feb. 12.

Both Houses attend the Prince and Princess of *Orange*, with a Declaration asserting the Rights and Liberty of the Subject, and resolve, that *William* and *Mary*, Prince and Princess of *Orange*, be declared King and Queen of *England*, *France*, and *Ireland*, to hold to them during their Lives, and the Life of the Survivor of them, and that the sole and full Exercise of the royal Power be only in, and executed by the said Prince of *Orange*, in the Names of the Prince and Princess, during their joint Lives; Remainder to the Heirs of the Body of the Princess, Remainder to the Princess *Anne* of *Denmark*, and the Heirs of her Body; Remainder to the Heirs of the Body of the Prince of *Orange*.

#### TABLE XVII.

**WILLIAM-HENRY** and **MARY**, Prince and Princess of *Orange*, proclaimed King and Queen with the usual Solemnity, Feb. 13.

Admiral *Herbert* cruises upon the *Irish* Coast with thirty Men of War, Feb. 27.

The Archbishop of *Canterbury*, the Bishops of *Glocester*, *Ely*, *Norwich*, *Bath*, *Wells*, and *Peterborough*, refuse to take the Oaths to King *William*, March 1.

King *William* orders sixty Men of War to be fitted out, March 2.

King *James* sails from *Brest* with a Body of *French* Troops to *Ireland*, March 5.

Both Houses address his Majesty, and a Fleet with twenty thousand Men are ordered to *Ireland*, March 8.

Dr. *Gilbert* elected Bishop of *Sarum*.

King *James* lands at *King'sale* with fifteen hundred *French* and marches for *Dublin*.

The Royal *Scotch* Regiment and *Dumbartons* declare for King *James*, but they are beat by the *Dutch* under *Gingble*, March 12.

1689.

Prince *George* of *Denmark* created Baron of *Oakingham*, Earl of *Kendale* and Duke of *Cumberland*, with Precedency of all Dukes by Act of Parliament, April 9.

The King and Queen crowned at *Westminster* by the Bishop of *London*, and Dr. *Burnet* preached the Coronation Sermon, April 11.

The same Day the Convention in *Scotland* declared the Throne vacant, and the King and Queen were proclaimed at *Edinburgh*.

Lord



Lord Chancellor *Jefferies* died in the *Tower* and was buried there, *Apr. 18.*

The King invites the *French* Protestants to *England*, *Apr. 29.*

War declared against *France*, *May 7.*

An Act passes for disarming Papists, *May 11.*

The King settles three hundred Pounds *per Annum* upon *Titus Oates* for Life, *May 31.*

Resolved by the House of Commons, that the Judgment given against the Rev. Mr. *Samuel Johnson*, (*Nov. 20, 1686*) was illegal and cruel, and a Bill was brought to reverse it, *June 11.*

King *William* gave Mr. *Johnson* three hundred Pounds *per Annum*, one thousand Pounds in Money, and gave his Son a Place of one hundred Pounds *per Annum* for being so good a Protestant, and shewing his dislike to Popery when it began to triumph.

King *James* coins Brass Money in *Ireland* and sets the Value of Silver upon it, *June 18.*

An Act for abolishing Episcopacy in *Scotland* received the Royal Assent, *July 22.*

Princess *Anne* delivered of a Son which was christened *William*, and afterwards created Duke of *Glocester*, *July 24.*

Pope *Innocent XI.* (called the Protestant Pope) died, *Aug. 2.*

Duke *Schomberg* sets sail for *Ireland* with ten thousand Land Forces, *August 12.*

The King gives Dr. *Walker* five thousand Pounds for defending *Londonderry* so bravely, *August 28.*

A Conspiracy discovered in *Schomberg's* Camp, carried on by *French* Papists; *Du Plessis*, a Captain, and five more were executed, and one hundred and fifty sent to *Holland*, *Sept. 28.*

A great Number of the *English* Army swept away by the Bloody Flux in *Ireland*, *Oct. 1.*

Cardinal *Ottoboni* elected Pope under the Name of *Alexander VIII.* *Oct. 6.*

The Archbishop of *Canterbury*, the Bishops of *Glocester*, *Ely*, *Norwich*, *Bath*, *Wells*, and *Peterborough*, suspended, *Oct. 13.*

The King accepts his Freedom of the Grocers Company, *October 24.*

Earls of *Peterborough* and *Salisbury*, Sir *Edward Hales* and *Obadiah Walker*, impeached of High Treason for adhering too closely to the Tenets of the Church of *Rome*, *Oct. 26.*

King *William's* Picture defaced in *Guildhall*, and five hundred Pounds offered, by Order of the Lord-Mayor, to any one who should discover it, *Nov. 21.*

The Commons address the King to make a Provision of fifty thousand Pounds *per Annum* for the Prince and Princess of *Denmark*, *December 18.*

1690.

King *William* embarks for *Ireland* the 11th of *June*, he arrives at *Carick-Fergus* the 14th, views his own Army the 21d, consisting of thirty-six thousand Men; then going to view the Posture of King *James's* Army on the other Side the *Boyne*, he received a slight Wound by a Shot from a Field Piece, *June* 30.

A Battle upon the Banks of the *Boyne*, the *Irish* gave Way the first Charge, so that the Son gained an easy Victory over the Father; and King *James* retreated with the *French* and *Swiss* and arrived at *Dublin*, and embarked for *France*. In the Battle were killed the Duke of *Schomberg* and Dr. *Walker*, *July* 1.

The King enters triumphant into *Dublin*, *July* 3.

Sir *Thomas Pilkington* re-elected Lord-Mayor of *London*, *Sept.* 29.

The Commons vote a Supply of four Millions and to raise an Army of sixty-nine thousand Men, *Oct.* 9.

Captain *James Campbell*, Brother to the Earl of *Argyle*, by the Assistance of Sir *John Johnston* and *Archibald Montgomery*, seized and took away Miss *Mary Wharton*, (a rich young Heiress but thirteen Years of Age) and she was forcibly married to Captain *Campbell*; but the Thing being fully proved the Parliament made void their Marriage, and Sir *John Johnston* was taken up, condemned, and hanged for it, *Nov.* 14.

The Commons vote a Supply of five hundred and seventy thousand Pounds for building seventeen Ships of the Line, *Dec.* 24.

King *William* with the Bishop of *London* and several of the Lords and Nobility, set out for *Holland* and arrive there, *Jan.* 16.

Pope *Alexander VIII.* died having reigned about fifteen Months, *Jan.* 30.

The Archbishop of *Canterbury* and the other Bishops deprived for not taking the Oaths, (see *October* 13, 1689) *Feb.* 5.

1691.

Dr. *John Tillotson*, Dean of *St. Paul's*, consecrated Archbishop of *Canterbury*, and he is succeeded by Dr. *Sherlock* to the Deanery, *May* 31.

Cardinal *Pignetelli* elected Pope, and takes the Name of *Innocent XII.* *July* 12.

*Limerick* in *Ireland* surrendered to the *English*, which put an End to the Wars there, *Oct.* 3.

King *William* returns from *Holland*, *Oct.* 19.

*Robert Boyle*, Esq; well known to all the learned World for his Philosophy, &c. died and left a large Sum for a Monthly Sermon

Sermon to be preached against Atheism, &c. now called *Boyle's Lecture*, Jan. 7.

The Poll-Act takes place, Feb. 24.

King *William* embarks for *Holland*, and arrives the next Day, March 6.

1692.

Queen *Mary* issues a Proclamation for a general Fast, March 26.

King *James* sends a Letter to several Lords and Commons of the Queen's being with Child, requiring them to be Witnesses at the Labour, April 2.

The *English* and *Dutch* Fleets under Admiral *Ruffel*, totally disperse the *French* Fleet under Admiral *Tourville*, and at *La Hague* and other Places, twenty-one Men of War were destroyed within a Day or two after the Battle, and among the rest the *French* Admiral in the *Rising Sun* was set on Fire in Sight of the *French* Army that intended a Descent upon *England*, May 19.

The Chevalier *De Millevoix* was hanged for giving Intelligence to the *French*; and the Chevalier *De Granvate* for conspiring to assassinate King *William*, August 4.

An Earthquake in *England*, Sept. 8.

King *William* returns to *England*, Oct. 20.

The King and Queen go to the Lord-Mayor's Feast at Guildhall, Oct. 29.

The Commons vote five Millions for the Charge of the War the ensuing Year, Nov. 15.

Admiral *Ruffel* set aside, and *Henry Killegrew*, Esq; Sir *Ralph Delaval*, and Sir *Cloudesty Shovell*, made joint Admirals of the Fleet, Nov. 31.

*Robert Yonge* tried at the King's Bench for Forgery, in counterfeiting several Noblemens Hands to a Conspiracy against the King, but particularly the Bishop of *Rocheſter*; and he was convicted and sentenced to stand in the Pillory, and pay a Fine of one thousand Pounds, Feb. 7.

1693.

King *William* embarked at *Gravesend* on March the 31st, and arrived in *Holland*, Apr. 2.

Admiral *Rooke* with twenty-three Men of War with the *Turkey* Fleet under Convoy, was met off *Cape St. Vincent* by the whole *French* Fleet under Admiral *Tourville*; the *French* took and destroyed twelve *English* and *Dutch* Men of War, and took about fourſcore Merchant Men, June 16.

The *French* beat the Confederate Army under King *William*, the Confederates were entirely routed, and about thirty thousand killed on both Sides, July 29.

The

The *French* again under *Monf. Catnat*, beat the *Confederates* commanded by the Duke of *Savoy* and *Eugene*, near *Turin*. This Battle was gained by the *French* on Account of their first using *Bayonets* at the End of their *Musquets*, *Sept. 24.*

King *William* arrived at *Harwich*, *Oct. 29.*

Admiral *Ruffel* again appointed Admiral of the Fleet, *Nov. 6.*

Dr. *Sancroft*, Archbishop of *Canterbury*, died in the seventy-seventh Year of his Age, *Nov. 22.*

A Magazine of two hundred and eighteen Barrels of Gunpowder blew up at *Dublin*, and killed about one hundred and twenty Men, *Feb. 17.*

1694.

*Hackney Coaches* licensed and regulated.

Admiral *Ruffel* destroys one large *French* Man of War in the Bay of *Bartram*, and took thirty-five Merchant Men, *May 11.*

The *English* under General *Talmash* came before *Brest*, but most of his Men were killed, and he himself mortally wounded and died in his Return to *Portsmouth*, *June 8.*

A great Fire at *Warwick* which burnt down the large Church and nearly three Quarters of the Town, *Sept. 5.*

The King returns from *Holland* to *Canterbury*, *Nov. 9.*

Dr. *John Tillotson*, Archbishop of *Canterbury*, died at *Lambeth* in the sixty-fifth Year of his Age, *Nov. 22.*

The Commons vote a Supply of four Million seven hundred thousand Pounds for the ensuing Year, *Nov. 30.*

Queen *Mary* taken with the Small Pox at *Kensington*, *Dec. 21.*

Queen *Mary* died in the thirty-third Year of her Age and in the sixth Year of her Reign, *Dec. 28.*

### WILLIAM III.

An Act for rebuilding the Town of *Warwick*, *Feb. 11.*

Queen *Mary* having laid in State nine Weeks at *Whitehall*, was buried in *Henry VIIth's Chapel*, and a Funeral Sermon preached for her by Archbishop *Tenison*. The great Bell in every Church in *England* was ordered to be tolled three Hours that Day, *March 5.*

*James Craggs*, one of the Contractors for clothing the Army, committed to the Tower by the Commons for refusing to shew his Accompts, *March 7.*

Bribery and Corruption now spread itself, and it appearing that several Frauds were practised, relating to several Bills, but particularly that of the Orphan's Bill; for Sir *John Trevor*, Speaker of the House of Commons, was found guilty upon Fact to have received of the City of *London* one thousand

Guineas



Guineas on passing the Orphan's Bill; and he was expelled the House, *March 12.*

The Commons resolve, that whoever should discover any Money or Gratuity given to, or received by any Member of the House, for any Matters transacted in the House, relating to the *East-India* Company, or Orphan's Bill, should have a proper Reward and the Indemnity of the House, *March 14.*

1695.

Sir *Thomas Cook*, a Member of the House and Governor of the *East-India* Company, called upon to give an Account of Money distributed in Bribes, but he refused and was committed to the *Tower*; and Mr. *Hungerford*, another Member, was expelled the House for receiving twenty Guineas for his Pains as Chairman of the Committee of the Orphan's Bill, *March 26.*

Sir *Thomas Cook* confesses he had distributed seventy thousand Pounds among the Friends of certain Courtiers, but would never tell who received it, *Apr. 23.*

An Act for imprisoning Sir *Thomas Cook*, Sir *Basil Firebrace*, *Charles Bates*, Esq; and *James Craggs*, Esq; \* *May 3.*

The Massacre at *Glenco* by the Earl of *Argyle's* Regiment upon the Family of Old *Mac Donald*, and almost all the Inhabitants.—This barbarous Fact made a great Noise all over *Europe*; some say it was designed, but it seems it was rather a Mistake, for *Hamilton* being called upon to give an Account he did not appear; for it seems he received private Orders from *Stairs* the Secretary.—However, Old *Mac Donald* having received the King's Promise of being protected, it was looked upon as a most impious Undertaking, and a most cruel Transaction, (see *Rapin* and *Salmon*) *May 9.*

A Fellow of *University College* in *Oxford* affirmed (as Dr. *Sherlock* had before) in his Sermon, that there were three distinct infinite Minds and 3 instances in the *Trinity*; but this was censured by the Convocation, *Nov. 23.*

The Commons vote the Sum of five Millions two hundred and fifty thousand Pounds for Supplies, *Nov. 30.*

A Tax of one Million two hundred thousand Pounds raised upon Windows to supply the Deficiency of clipped Money, *December 31.*

\* Sir *Thomas Cook*, Sir *Basil Firebrace*, with *Bates* and *Craggs*, were imprisoned at the Clamours of the People for their Bribery and Corruption; the three first were degraded, and their Names were made use of by Persons out of Favour; but *Craggs* survived all this and lived long enough to plunder his Country in a more eminent Degree, that even the best Historians allow it would have been happy for the Publick had he been hanged long before, See *Voltaire*, *Rapin*, *Howell*, *Salmon*, &c.

The



The *Royal Sovereign*, the largest Man of War, burnt by Accident, *Jan. 27.*

King *James* came to *Calais* in order to embark for *England* with a Body of *French* Troops, but Admiral *Russel* with a Fleet appearing before *Dunkirk* the Scheme was prevented, *March 2.*

Guineas go currently for thirty Shillings upon calling in the clipt Money, *March 7.*

*Charnock*, King, and *Keys*, for conspiring against the Life of the King, are convicted and executed at *Tyburn*, *March 18.*

1696.

Sir *John Friend* and Sir *William Perkins* are tried and convicted of High Treason in conspiring the King's Death, and creating a Rebellion, and were executed at *Tyburn*, *Apr. 3.*

Brigadier *Rookwood*, *Lowick*, and *Cranburn*, executed at *Tyburn* for being concerned in the Assassination Plot, *Apr. 21.*

The Quakers having frequently denied an Oath, an Act passes that the solemn Affirmation and Declaration for or against any Thing, shall be equal to an Oath in Form, *Apr. 27.*

*Peter Cook*, Esq; Son of Sir *Miles Cook*, convicted in the late Plot of Conspiracy, but the King pardoned him for his Youth's sake, and because it did not evidently appear he had any Design against the King's Person, *May 22.*

The Commons vote five Millions for raising forty thousand Landmen, and eighty-seven thousand Seamen, *Nov. 4.*

Bank Notes were discounted at twenty *per Cent.* and Government Tallies at forty, fifty, and sixty *per Cent.*

1697.

The Weavers in *London* assemble at the *East-India House* in a tumultuous and resolute Body, on account of *Callicoes* and other *Indian Manufactures*, *Apr. 14.*

*Charles XI.* King of *Sweden* died in the forty-second Year of his Age and twenty-seventh Year of his Reign.

The King embarked at *Margate* for *Holland*, *Apr. 25.*

Peace with *France* proclaimed in *London*, *Oct. 19.*

The King returns to *London*, *Nov. 16.*

A Fire at *Whitehall* which consumed the Whole except the Banqueting-House, *Jan. 4.*

The *Czar* of *Muscovy* came to *London*, *Jan. 11.*

The Society for propagating the Gospel in Foreign Parts was (about this Time) elected, and selected of the most able Persons, which was encouraged by many of the Nobility, Gentry, &c.

1698.

An Act of Parliament for dissolving the Marriage between  
*Charles*

*Charles Earl of Macclesfield, and Anne his Wife, and to illegitimate the Children of the said Anne, \* Apr. 2.*

Count *de Tallard*, Embassador from *France*, makes his public Entry into *London*, *May 16.*

*John Goudet* and others found guilty in importing *French* Lustings, and are fined very heavily, *July 4.*

An Act for raising annually seven hundred thousand Pounds for the Service of his Majesty's Household, *July 5.*

An Act for licensing Hawkers and Pedlars.

An Act for stopping the Coining of Halfpence and Farthings for one whole Year.

The King, after returning the Commons Thanks for this and many other Acts, as also for remedying the Corruption of the Coin, and providing so plentifully for his Household, embarks for *Holland*, *July 20.*

The King returns from *Holland*, *December 1.*

*John Archdale*, a Quaker, elected Member of Parliament for the Borough of *Chipping-Wicomb*, in *Bucks*, but upon Refusal of taking the Oaths, another Burgess was chosen, *Dec. 4.*

A great Scarcity of Corn, which occasioned an Act to prohibit the Exportation of any for one Year, *Feb. 1.*

A particular Order sent to the Play-houses not to ridicule nor act any Thing contrary to Religion and Decency, *Feb. 13.*

The King sends the Commons a Letter, that he does not think himself well used in having the *Dutch* Guards removed from his Person, but that he was ready to send them away if it was any ways disagreeable. [This was written with his own Hand, *Clarendon* and *Salmon*] *March 18.*

1699.

*Dr. Edward Stillingfleet*, Bishop of *Worcester*, died, *March 27.*

*Billinggate* made a Free Market by Act of Parliament, *May 4.*

The King embarks for *Holland* from *Margate*, and landed the next Day, *June 2.*

*Charles V. King of Denmark*, died in the fifty-third Year of his Age, and was succeeded by *Frederick IV. Sept. 4.*

*Sir Richard Levett* elected Lord-Mayor of *London*, *Sept. 29.*

The King returns to *England*, *Oct. 18.*

The King reminds the Parliament of the great Debt owing to Prince *George of Denmark*, recommends them also to make some further Provision for the Poor.—The Commons in their Address set forth their great Uneasiness, that after such Provisions of every Sort, any Jealousy should arise concerning their

\* *N. B.* The Earl not cohabiting with his Lady *Anne* for several Years, she had two Children by others, whereupon this Act was granted; but it appearing rather *his* than *her* Fault, she had her whole Fortune returned upon parting.

Duty and Affection, desiring also, at the same Time, that his Majesty would discourage all such as spread any false Reports and create any Misunderstandings.—To this the King kindly answered, that no Person had ever dared to misrepresent their Proceedings, for that he was so sensible of their Affection, that had any such Thing happened the Persons concerned in such Misrepresentations should have certainly felt the highest Marks of his Displeasure. *Nov. 16 to 29.*

The Commons enquire into the forfeited Estates of *Ireland*, and find above four hundred thousand Acres of Ground, amounting to an immense annual Sum, of which above ninety thousand Acres, about twenty-five thousand Pounds a Year, the private Estate of King *James*, was granted to the Lady *Elizabeth Villiers*, Countess of *Orkney*, a she Favourite of King *William's*, the rest was granted to the Earl of *Romney*, *Dec. 14.*

The Commons resolve to convert all the forfeited Estates of *Ireland*, and all Grants thereof (from *Feb. 1688*) to the Good of the Publick, by bringing in a Bill of Resumption, *Dec. 15.*

*William Stevens*, Rector of *Sutton* in *Surry*, preached before the Commons a notorious Discourse, proving all Right in the People, and excused the horrid Act of murdering King *Charles I.*—Instead of receiving the customary Thanks from the House they resolve, *That from henceforth no Person under the Dignity of a Dean, or at least has not taken the Degree of Doctor of Divinity, should preach before the House*, *Jan. 30.*

A Proclamation for banishing all Popish Priests and Jesuits, *&c. Feb. 8.*

The King is very angry with the Commons for their Resolutions in settling the Affair of the forfeited Estates in *Ireland*, *&c. &c. Feb. 21.*

The Commons return Answer to his Majesty, that whoever advised his Majesty to the contrary could be no Friend to him nor the People, but only endeavoured to create Misunderstandings, *Feb. 22.*

1700.

The Commons print the Reason of their Resolution concerning the forfeited Estates in *Ireland*, *Apr. 8.*

The Commons resolve that an Address be made, that no Person who was not a Native (save *George Prince of Denmark*) be admitted to be of his Privy-Councils, in *England* or *Ireland*, but his Majesty prevented the Address by proroguing the Parliament to the 23d of *May*, *May 9* and *10.*

An Act to dissolve the Duke of *Norfolk's* Marriage with Lady *Mary Mordaunt*, and to enable him to marry again, *April 25.*

The Great Seal taken from Lord *Somers*, and given to Sir *Nathan Wright*, *May 21.*

The King embarks at *Margate* for *Holland*, *July 1.*

The Duke of *Glocester*, only surviving Son of the Prince of *Denmark*, died at *Windſor* in his twelfth Year, *July 30*, and was interred in *Henry VII's Chapel*, *Aug. 9.*

King *William* returned to *England*, *Sept. 18.*

Pope *Innocent XII.* died, aged eighty-six years, *Sept. 28.*

Sir *Thomas Abney*, Knight, elected Lord-Mayor of *London*, *Sept. 29.*

*Charles II.* King of *Spain*, died in the thirty-ninth Year of his Age and thirty-sixth Year of his Reign, *Oct. 21.*

Cardinal *Albani* elected Pope by the Name of *Clement XI.* *Nov. 12.*

*Philip* Duke of *Anjou*, proclaimed King of *Madrid*; but the Emperor and Pope protest against it, *Nov. 13.*

The King of *Sweden* gains a compleat Victory over the *Muscovites* near *Narva*, *Nov. 30.*

The Parliament met and the King represented to them, that as the Duke of *Glocester* was dead, it was absolutely necessary that they should consider of the Succession in a Protestant Line, *Feb. 10.*

A Convocation opened, and Dr. *Hooper*, Dean of *Canterbury*, chosen Prolocutor, *Feb. 11.*

The Commons come to a Resolution concerning a further Limitation of the Crown, &c. and among other Things resolved, That *England* shall not be obliged to enter into a War for the Defence of any foreign Dominions of succeeding Kings; that after King *William* and the Princess *Anne*, the Crown be limited to the Princess *Sophia* of *Hanover*, and the Heirs of her Body, being Protestants, *March 11.*

1701.

*Philip* King of *Spain*, *April 14.*

*Kidd*, *Loft*, *Parrot*, and *Mullins*, Pirates, hang'd at Execution Dock, *May 8* and *9.*

*John* Earl of *Marlborough*, made General of the Foot, *Jan. 1.*

The House of Lords and Commons disagree concerning the Trial of Lord *Hallifax*, *Somers* Earl of *Orford*, and others; the Lords sent the Commons Word that they should proceed to the Trial of the Earl of *Orford* on Monday next; the Commons order that none of the Members presume to be at the Trial, *Jan. 20.*

The House of Lords acquit Lord *Somers* and the Earl of *Orford*; and the Charge and Impeachments against Lord *Haversham*, the Earl of *Portland*, and Lord *Hallifax*, was set aside for want of the Prosecution of the House of Commons; but this the House of Lords highly resented, *June 23* and *24.*

King *William* goes to *Holland*, *July 1.*

King *James II.* died of a Lethargy at *St. Germaines* in *France*,



in the eighty-sixth Year of his Age ; his Body was deposited in the Monastery of the *Benedictines*, and his Heart sent to the Nunnery of *Chaillot*, Sept. 6.

He left Issue that survived him were the Princess *Anne* of *Denmark*, had by his first Dutchess Lady *Anne Hyde* ; and his Sons *James*, *Francis*, *Edward*, and his Daughters *Louisa*, *Maria-Teresa*, whom he had by Queen *Mary*, Daughter to *Alphonso de Este*, Duke of *Modena*.

The King of *France* immediately upon the Death of *James II.* caused his Son to be proclaimed King of *England*, *Scotland*, and *Ireland*, under the Name of *James III.* upon which King *William* sent an Express to the Earl of *Manchester*, his Ambassador at *Paris*, to return immediately Home without taking his Leave of the Court, and also another to *England* to order Monsieur *Poussin*, the *French* Secretary, to depart the Kingdom forthwith, Sept. 9.

The City of *London*, and the Cities and Counties in general address the King, and shew their Abhorrence of the *French* King's proclaiming the Prince of *Wales*.

King *William* concludes an Alliance with the Emperor and *States-General* against *France*, called the *Grand Alliance*, Sept. 7.

Whether at the Surprize of the King of *France* so soon proclaiming *James* King of *England*, &c. or by Fatigue, so it was that King *William* was taken very ill, and lay dangerously ill above a Fortnight, but it was very wisely concealed till the middle of *October*.

The King returns from *Holland*, Nov. 5.

An Act passed the Royal Assent for the Attainder of the pretended Prince of *Wales* of High Treason, and from this he was called the *Pretender* in common, March 2.

King *William* died at *Kensington* in the fifty-second Year of his Age and fourteenth of his Reign, and was buried in *Henry VII's* Chapel in *Westminster* Abbey. King *William* was the Posthumous Son of *William* Prince of *Orange*, by Princess *Mary*, eldest Daughter of *Charles I.*

#### T A B L E XVIII.

Queen *ANNE*, the only surviving Child of *James II.* by the Lady *Anne Hyde*, eldest Daughter of *Edward* Earl of *Clarendon*.

The Earl of *Marlborough* declared Captain General of all her Majesty's Forces both in *England* and Abroad, March 15.

1702.

The Earl of *Marlborough* sent to *Holland* as Ambassador and Plenipotentiary, March 28.

The



The Funeral Solemnities for King *William* were as follows. The Corps was brought from *Kensington* to *Westminster*, in an open Chariot, attended by a vast Number of Coaches of the Servants of the Household, and of the Lords Spiritual and Temporal, &c. The Pall was supported by six Dukes; the Prince of *Denmark* was chief Mourner, supported by two Dukes and followed by sixteen of the first Earls of *England* as Assistants; the Corps was interred in *Henry VII's* Chapel, in the same Vault with the late Queen *Mary* his Consort and King *Charles II.* April 12.

Prince *George* of *Denmark* was declared in Council Generalissimo of all her Majesty's Forces by Sea and Land, Apr. 17.

The Duke of *Ormond* appointed Commander of all the Land Forces on board the Fleet, Apr. 20.

The Queen crowned at *Westminster*, Apr. 23.

War declared against *France* by the Queen, the Emperor, and the *States-General*.

The great Battle of *Luzara* in *Italy* between the *Imperialists* under the Command of Prince *Eugene*, and the *French* and *Spaniards* commanded by King *Philip* and the Duke of *Vendosme*, the Slaughter was very great on both Sides, so that neither could rightly claim the Victory, Aug. 4.

Sir *Samuel Dashwood*, Knight, elected Lord-Mayor of *London*, Sept. 29.

The *English* under Sir *George Rook*, accompanied by the *Dutch*, attack the *French* Fleet and *Spanish* Galleons at *Vigo* in *Gallicia*: The *English* took five large Men of War and four Galleons, and the *Dutch* one large Man of War and four Galleons; there was about fourteen Men of War destroyed and a large Quantity of Plate and rich Effects taken, Oct. 12.

Lord *Shannon* arriv'd at *London* with Advice, that the Duke of *Ormond* and Sir *George Rook* had taken and destroyed the whole *French* Squadron and *Spanish* Galleons near *Vigo*, Oct. 30.

The Earl of *Marlborough* having met with great Success in almost every Undertaking abroad, the Queen sent to the Commons to let them know she thought fit to grant the Title of Duke of this Kingdom to the Earl of *Marlborough* and the Male Heirs of his Body, as also a Pension of five thousand Pounds per Annum out of the Post-Office, to him and his Posterity; but this occasioning Debates it dropt for the present, Dec. 10.

*John* Earl of *Marlborough* created Marquis of *Blandford* and Duke of *Marlborough*, Dec. 14.

The Queen orders that the Words *SEMPER EADEM*, to be used as her Motto in her Arms.

The House of Lords and Commons disagree very much in relation to *Charles* Lord *Halifax*, Auditor of the Exchequer, he being accused by the Lords of a Breach of Trust, they address

dress the Queen that the Attorney-General might proceed to a Prosecution, *Feb. 4.*

The Commons deny the Lords to have any Right to intermeddle with public Accounts, whereupon the Conference then held broke up with great Heat on both Sides, *Feb. 16.*

The Duke of *Marlborough's* only Son died of the Small-Pox at *Trinity College Cambridge*, *Feb. 20.*

A Book intituled, *The shortest Way with the Dissenters*, wrote by one *De Foe*, ordered to be burnt by the Hands of the Hangman, and the Author prosecuted, *Feb. 25.*

*Aubrey de Vere* Earl of *Oxford*, and first Earl of *England*, died, *March 12.*

The Episcopal Clergy of *Scotland* address her Majesty, setting forth the Hardships they suffered at the Revolution: Her Majesty promises them her Protection, but desires they would be patient and live peaceably with the Presbyterian Clergy, *March 13.*

1703.

Captain *Kirby* and Captain *Wade* were shot at *Portsmouth* for betraying and deserting Admiral *Benbow* in the Engagement with *Du Casse*, *Apr. 6.*

Sir *Cloudsley Shovel* arrives in *Lisbon* River with the Confederate Fleet, they appear before *Althea* in *Spain*, landed two thousand five hundred Men, and invited the *Spaniards* to desert King *Philip* and come over to *Charles III.* accordingly the Emperor and the King of the *Romans* resign their Right to the Arch-Duke *Charles*, who was declared King of *Spain* by the Name of *Charles III.* *Sept. 1.*

Sir *John Parsons*, Knight, elected Lord-Mayor of *London*, *Sept. 29.*

The *Grand Signior* deposed, and his Throne usurped by his Brother.

The most terrible Storm of Rain and Hail, with a South West Wind, attended with severe Flashes of Lightning, happened this Day about Midnight. It uncovered Roofs of Houses, blew down Spires of Steeples and Chimnies in abundance, both in Town and Country: Tore up large Trees by the Roots, and took the Lead off many Churches and rolled it up like Scrolls of Parchment: Many Boats, and Craft of all Sorts were sunk or damaged in the *Thames*; but what was worse, the Royal Navy just returning from the *Streights*, four third Rates, one second Rate, four fourth Rates, and many other lesser Rates were cast away upon the *English* Coast, and above fifteen hundred Seamen were lost, besides a Number of Sailors in Merchant Men, &c. *Nov. 26.*

The Queen made a Speech to both Houses, in which she told them of a Design of a Plot that was carried on in *Scotland* by the

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the Emiffaries of *France*, and that as soon as she had further examined into it she would lay it before them. Upon this the Lords appoint a Committee to examine into the Plot; but the Commons are disgusted at the Lords presuming to take the Authority out of the Queen's Hands.—The Lords insist upon it that they had an undoubted Right to examine, and order such as they thought guilty into Custody, &c. These Things rose to a great Height between both Houses, and both made Representations to her one against the other, Dec. 19, 20 and 21.

*Charles III.* King of *Spain* arrived at *Spithead*, and went to *Windsor*, Dec. 26.

A reasonable or scandalous Paper call'd the *Observer*, being taken Notice of, a Proclamation is issued for apprehending *John Tutchin*, the Author, *John How*, Printer, and *Benjamin Bragg* the Publisher, Feb. 24.

1704.

The *English* and *Dutch* Forces under the Command of *Schomberg* and *Fagel*, arrive at *Portugal* with twelve thousand Men, then *Charles III.* published a Declaration, that all his *Spanish* Subjects that would return to their Duty in three Months should be pardoned.—The King of *Portugal* at the same Time published a Declaration, in which he declared *Philip* to be only a Usurper, and that *Charles III.* was lawful King<sup>s</sup> of *Spain*, April 23.

King *Philip* declares War against the King of *Portugal*, and against King *Charles III.* and his Allies, Apr. 30.

*Stanislaus Lenziuskie*, a *Palatine* of *Posen*, elected King of *Poland* at *Warsaw* by the Confederate *Poles*.

The Confederate Fleet under the Prince of *Hesse* land a large Body of Troops in the Bay of *Gibraltar*, and attacked that Place July 21, and it surrenders, July 24.

The great and famous Battle of *Hockstet*, viz. The Confederate Army under Prince *Eugene* and the Duke of *Marlborough*, fought the *French* and *Bavarians* under the Command of the Elector of *Bavaria*, Marshal *Tallard*, and Marshal *Marsin*, and obtained a compleat Victory over them: Marshal *Tallard* and upwards of thirteen thousand *French* and *Bavarians* were taken Prisoners, twenty thousand kill'd, wounded, or drown'd in the *Danube*; there were taken also by the Allies above one hundred Pieces of Cannon, twenty-four Mortars, one hundred and twenty-nine Colours, one hundred and seventy-one Standards, seventeen Pair of Kettle Drums, three thousand six hundred Tents, with their Treasure, Baggage, Ammunition, &c.—Tho' this Victory observe cost the Allies near fifteen thousand Men, August 2.

An Engagement between Sir *George Rook* and the *French* Commander *De Thoulouse*, in the *Streights*; the *English* wanted Ammu.

Ammunition or had gained a compleat Victory; however, the *French* sheer'd off and never appeared there to dispute their Dominions in that Place, *August 13.*

The Emperor creates the Duke of *Marlborough* Prince of the Empire, *August 28.*

The *French* and *Spaniards* besiege *Gibraltar*, *Oct. 22.*

Admiral *Leake* sailed for *Lisbon* with Forces for *Gibraltar*, and arrive there, *Nov. 9.*

Sir *Roger le Strange* died, aged eighty-eight, *Dec. 11.*

The Duke of *Marlborough* returns to *England* with Count *Tallard* and the rest of the most noted Prisoners; he brought with him also the Colours and Standards that were taken at *Hockstet*, and they were hung in *Westminster-Hall*, *Jan. 3* following, *Dec. 14.*

Count *Tallard* and some of the most choice Prisoners were sent to *Nottingham*, others to *Litchfield*.

The Duke receives the Thanks of both Houses of Parliament for his great Services, *Dec. 14.*

Admiral *Rook* set aside, and Sir *Cloudsley Shovel* made Admiral of the Fleet, Sir *John Leake* Vice Admiral of the White, Sir *George Byng* Vice Admiral of the Blue, Sir *Thomas Dilks* Rear Admiral of the Red, *William Whetstone*, Esq; Rear Admiral of the White, and Sir *John Jennings* Rear Admiral of the Blue, *Jan. 18.*

An Act passed to grant the Honour and Manor of *Woodstock*, with the Hundred of *Wotton*, to the Duke of *Marlborough* and his Heirs, for his Services to her Majesty and the Publick, *March 14.*

An Act for prohibiting all Trade and Commerce with *France*, *March 16.*

An Order of Council by which the *Dutch* have Liberty to trade with *France* notwithstanding the Act, *March 19.*

Admiral *Leake* surprizes the *French* Squadron (under the Command of *Monf. Pointi*) before *Gibraltar*, took three of their Men of War and sunk and destroyed several others, by which means they and the *Spaniards* raised the Siege, *Nov. 10.*

1705.

Dr. *George Bull* consecrated Bishop of *St. Davids*, *Apr. 29.*

*Leopald*, Emperor of *Germany*, died, and was succeeded by *Joseph* his eldest Son, *May 5*, N. S.

Sir *Thomas Rawlinson*, Knight, elected Lord-Mayor of *London*, *Sept. 29.*

Dr. *William Wake* consecrated Bishop of *Lincoln*, *Oct. 10.*

King *Stanislaus* was crowned King of *Poland*, *Oct. 20.*

Queen *Catherine*, Dowager to King *Charles II.* of *England*, and Sister to the present King of *Portugal*, died *Dec. 21.*

Letters



Letters Patent granted to send Prince *Eugene* two hundred and fifty thousand Pounds to relieve the Duke of *Savoy*; the Queen also sent him two hundred thousand Crowns, *Feb. 16.*

The Light House on *Edystone* Rock rebuilt by Act of Parliament, *March 19.*

1706.

The Duke of *Marlborough* embarks for *Holland* to open the Campaign, *April 10.*

The *Venetian* and *Morocco* Ambassadors made their public Entry into *London*, *Apr. 23.*

The *French* and *Spaniards* lay Siege to *Barcelona*, but Sir *John Leake* appearing with the *English* Fleet the *French* raise the Siege, leaving behind them one hundred and six Brass Cannon, twenty-three Mortars, and a vast Quantity of Ammunition and Provision, *May 1.*

The same Morning about nine o'Clock there was a very large eclipse of the Sun, eleven Digits and a Quarter being eclipsed.

The Duke of *Marlborough* obtained a compleat Victory over the Elector of *Bavaria* and Marshal *Villeroy*, at *Ramillies*, (on *Whitsunday* about nine o'Clock in the Morning); four thousand of the Enemy were kill'd, and about six thousand taken Prisoners, with great part of their Baggage and heavy Artillery, *May 12*, being *Whitsunday*.

The Confederates also, were very active; for they took Possession of *Louvain*, and in about ten Days after caused *Brussels*, *Mechlin*, *Ghent*, *Oudenarde*, *Bruges*, *Antwerp*, and many other Places in *Flanders* and *Brabant*, to declare their Submission, and acknowledge *Charles III.* King of *Spain*, for their Sovereign, *May 13.*

The *Portuguese* hearing the Siege of *Barcelona* was raised, they march directly to *Madrid*; upon which King *Philip* retires to the Confines of *France*, *June 7.*

*Carthagena* in *Spain*, and *Ostend* in *Flanders*, surrender to the Allies, *June 13* and *20.*

The Marquis *das Minas*, and the Earl of *Galloway*, took Possession of *Madrid*, (Capital of *Spain*) and *Charles III.* was (on the 27th) proclaimed King, *June 24.*

Prince *Eugene* passes the *Po* in order to relieve *Turin*, *July 6.*

Articles of Union between *England* and *Scotland* signed by the Commissioners of both Kingdoms, *July 22.*

*Charles III.* being very dilatory in hastening his March to *Madrid*, and staying too long at *Arragon*, King *Philip* took the Advantage of his Neglect, and with a large Body of Troops took Possession of *Madrid* again; and then *Toledo*, *Salamanca*, and many other Towns declared for him again, *July 25.*

*Turin*



*Turin* having undergone four Months Siege by the *French*, the Duke of *Savoy* and Prince *Eugene* attacked the *French* in their Intrenchments, forced them and gained a compleat Victory. In this Engagement the Duke of *Orleans* and Marshal *Marfin* were wounded, near five thousand of the *French* kill'd, and above seven thousand taken Prisoners: The Allies took one hundred and fifty Pieces of Cannon, with all the Baggage, Arms, and Ammunition, *Sept. 7.*

Sir *John Leake* takes *Majorca*, which declares for King *Charles III.* *Sept. 14.*

*George Augustus*, Electoral Prince of *Hanover*, created Baron of *Tewksbury*, Viscount *Northellerton*, Earl of *Milford Haven*, Marquis and Duke of *Cambridge*, *Oct. 5.*

Prince *Eugene* made Governor of the Dutchy of *Milan*, *November 14.*

*Carthage* retaken from the Allies, *Nov. 18.*

*Don Pedro*, King of *Portugal*, died in the fifty-eight Year of his Age, and is succeeded by his Son *Don Juan IV.* *Dec. 3.*

The Lords and Commons address her Majesty, and congratulate her on Account of the Success in the Victories of *Ramillies* and *Turin*, *Dec. 4.*

An Act for settling the Honour and Dignities of *John Duke of Marlborough* upon his Posterity, annexing the Manor of *Woodstock* and House of *Blenheim*, to go with the said Honours, *Dec. 21.*

Her Majesty erects *Blenheim House*, (which, 'tis said, cost one hundred thousand Pounds) and she desires that a Pension of five thousand Pounds *per Annum*, be settled upon it for the more honourable support of the Manor of *Woodstock*, *Jan. 8.*

An Act passes for the above Settlement of five thousand Pounds *per Annum*, on the Dignities of the Manor of *Woodstock* and *Blenheim House*, *Jan. 28.*

At the settling of the Union Lord *North* and *Grey* would have made some Alteration, relating to the *Scots* exercising what they stiled their *true Religion*, but upon ratifying the Union the Queen waved these little Cavils, and desired that from henceforth her Subjects would act with all possible Kindness and Tenderness to each other, *March 6.*

A Treaty concluded between the *Imperialists* under *Eugene*, and the *French* under *Vaudemont*, in which it was agreed that the *French* should evacuate *Final*, and all other Places in *Italy*, *March 13.*

1707.

The *French* and *Spaniards* entirely defeat the Confederates, the Marquis *das Minas*, and the Earl of *Galway*, at *Almanza*. The *Portuguese* Horse abandoned the Foot the first Discharge, and

and the Foot were almost all cut to Pieces or taken Prisoners, April 14.

This Day being appointed for a Thanksgiving for the Union, the Queen went to St. Paul's in great State, and heard a Sermon by the Bishop of Oxford, May 1.

Dr. William Sherlock, Dean of St. Paul's and Master of the Temple, died in the sixty-seventh Year of his Age, June 8.

Prince George of Denmark took the Oaths, being appointed Lord High Admiral of Great Britain, &c. &c. and he appointed Sir David Mitchell, George Churchill, Esq; Robert Walpole, Esq; and Sir Stafford Fairborne, to be of his Council.

The Duke of Savoy and Prince Eugene, by the Assistance of Admiral Showell and the Confederate Fleet, pass the Var with forty thousand Men, beat the French from their Intrenchments, and gain a Passage through Provence and Thouloun, May 10.

King Charles III. of Spain proclaimed at Naples, July 31.

The English Fleet of Merchant Men going to Lisbon were attacked by the Brest and Dunkirk Fleets off the Lizard, and three Men of War, (part of the English which convoyed them) and many of the Transports were taken, the Devonshire Man of War blew up, and the Royal Oak with Difficulty escaped to Ireland, Oct. 9.

Admiral Showell and Admiral Byng, coming from the Mediterranean, the latter apprehended he was near the Rocks of Scilly; the Weather being hazy he lay by 'till Evening, and then made a Signal for sailing, but in a short Time after Showell's Ship, the Association, with the Eagle and Romney Men of War, were dash'd to Pieces on the Rocks called the Bishops, and his Clerks, and the Admiral, and Crews perished. The Firebrand also was cast away, and but twenty-four of her Hands saved; but Admiral Byng having Time, and seeing this Misfortune, immediately altered his Course, and saved himself and the rest of the Fleet, Oct. 22.

The first Parliament of Great-Britain met, Oct. 23.

Sir William Withers, Knt. Lord-Mayor of London, Oct. 29.

His Royal Highness the Lord High Admiral promoted; Sir George Byng Admiral of the Red, Sir John Jennings Vice Admiral of the Red, Sir John Norris Vice Admiral of the White, Lord Dursley Vice Admiral of the Blue, Sir Edward Whitacre Rear Admiral of the Red, and John Baker Vice Admiral of the White, Jan. 16.

Sir George Byng at Edinburgh Frith engaged the French Fleet, took one Man of War called the Salisbury, on Board of which were Lord Griffin, Lord Clermont, Mr. Middleton, the Marquis de Levi, and others, and five Companies of French Soldiers; he also chased the rest, but lost Sight of them, March 13.

Twenty-four Acts of Parliament passed this Year.

1708.

The Lords *Griffin*, *Clermont*, &c. taken in the *Salisbury* Oct. 23 last, were committed to the *Tower* for High Treason, April 10.

Admiral *Leake* took sixty Vessels laden with Provisions for the Duke of *Orleans*, and carried them into *Barcelona*, May 22.

Commodore *Wager*, with only four Men of War, fell in with seventeen *Spanish* Gallions near *Carthagena* in the *West-Indies*, the *Spanish* Admiral's Ship only was reckoned worth thirty Millions of Pieces of Eight, (which is upwards of six Millions of Pounds Sterling) was blown up, and the Rear Admiral taken. Commodore *Wager*'s Share only, was one hundred thousand Pounds, and upon his Return he was made Rear Admiral for his Service, May 28.

Dr. *William Fleetwood* consecrated Bishop of *St. Asaph*, June 6.

The Duke of *Burgundy* and *Berry*, the Chevalier de *St. George*, and the Duke of *Vendosme*, laid Siege to *Oudenarde*; but the Duke of *Marlborough* and Prince *Eugene* attacked them near the Place, defeated them and forced them to retire to *Ghent*, and took about six thousand Prisoners, beside a great Slaughter that was made among the Foot, July 11.

The Duke of *Marlborough* levelled all the *French* Lines between *Ypres* and *Lys*, and put all *Picardy* under Contribution, July 26.

Sir *John Leake* arrived before *Cagliari*, the Capital of *Sardinia*, and the whole Island declared for *Charles III.* of *Spain*, August 12.

Sir *Charles Duncombe* elected Lord-Mayor of *London*, Sept. 29.

The Island of *Minorca* with the commodious Harbour of *Port-Mahon*, taken by General *Stanbope*, and made to pay Obedience to *Charles III.* of *Spain*, Sept. 30.

The Town of *Lisle* taken, but it cost the Allies, first and last, twelve thousand Men, Oct. 23.

Prince *George* of *Denmark*, her *British* Majesty's Consort, died of an Asthma at *Kensington*, aged fifty-five, Oct. 28. \*

*Ghent* surrendered to the Duke of *Marlborough*, Dec. 30.

A Pamphlet proposing to take off the Sacramental Test burnt by the common Hangman, Jan. 12.

1709.

Prince *Eugene*, the Duke of *Marlborough*, and the Marquis de *Torcy*, met together at the *Hague* to settle Preliminaries of Peace, May 8.

\* He was born at *Copenhagen* April 1653, and married to her Majesty July 1683, and after lying in State in the Painted Chamber, he was buried privately in *Westminster-Abbey*, Nov. 11.

Sir

Sir *John Leake* constituted Rear Admiral of *Great-Britain*, May 18.

Preliminaries of Peace were settled and agreed upon, the *Imperial*, *English*, and *Dutch* Ministers signed them; but *Monf. de Torcy* and *Rouille* refused signing them, tho' they had before consented; and the *French* King also absolutely rejected them, upon which another vigorous Campaign was preparing on both Sides, May 28.

The Pope at last acknowledges *Charles III.* to be King of *Spain*, June 7.

On the 11th of *September*, N. S. was fought the remarkable Battle of *Blaregnies*, or *Malplaquet*, near *Mons*; the Allies under Prince *Eugene* and the Duke of *Marlborough*, and the *French* under the Marshals *Villars* and *Boufflers*; each Army consisted of about one hundred thousand Men, allowed on both Sides to be the finest Troops ever seen. The *French* were posted in and about the Woods of *Sart* and *Sansart*, where they cut down abundance of Trees, and in other Places were covered with and by double and triple Entrenchments: This Situation was so advantageous, and their Artillery so well planted, that the Confederates, upon approaching to attack them, were mowed down like Corn; but at length they forced the Entrenchments with the Loss of about twenty thousand Men; the *French* having lost about twelve thousand, and Marshal *Villars* being wounded they retired in good Order under Marshal *Boufflers*; but the Confederates were not in a Condition to follow them, August 31.

Sir *Samuel Garrard*, Bart. elected Lord-Mayor of *London*, Sept. 29.

The Electoral Princess of *Hanover* delivered of a Daughter, named *Anne*, Oct. 9.

Dr. *Henry Sacheverell's* noted Sermon preached before the Lord-Mayor and Aldermen at *St. Paul's*, in which he accused the Ministry of being false Brethren to the Church—[This made a great Noise] Nov. 5.

The Earl of *Orford*, Sir *John Leake*, Sir *George Byng*, Knts. *George Doddington* and *Paul Methuen*, Esqs; were constituted Commissioners for exercising the Office of Lord High Admiral, in the room of the Earl of *Pembroke*, Nov. 8.

Dr. *Sacheverell* was brought before the House for preaching his Sermon on Nov. 5; it was resolved that it was scandalous and seditious; the Doctor acknowledged the Discourse to be his, but said that Sir *Samuel Garrard*, Lord-Mayor, encouraged the printing it: Sir *Samuel* denies it, upon which the Doctor was impeached at the Bar of the House of Lords for High Crimes and Misdemeanours, Dec. 15.

This Day it began to freeze very hard, and the third Day there fell a very deep Snow; then it froze yet harder, and with



small Remissions lasted full three Months, so that the *Thames* was frozen to that Degree that Booths were erected upon it, and all Manner of Diversion and Exercise was used upon the Ice, Dec. 25.

*Robert Walpole*, Esq; made Treasurer of the Navy, Jan. 13.

*Sir George Rooke* died, Jan. 24.

The Trial of *Dr. Sacheverell* came on before the House of Peers at *Westminster-Hall*, where her Majesty was present (*incognito*) several Days, Feb. 27.

At the Trial of *Dr. Sacheverell*, the Council Managers for the Commons were, *Sir John Holland* Comptroller, Mr. Secretary *Boyle*, Mr. *Smith* Chancellor of the Exchequer, *Sir James Montague* Attorney-General, *Robert Walpole*, Esq; Treasurer of the Navy, with twelve other Gentlemen of Note; and the Doctor's Council were, *Sir Simon Harcourt*, Mr. *Dodd*, Mr. *Phipps*, Mr. *Dee*, and Dr. *Henchman*. The Mob that attended at *Sacheverell's* Trial attacked the Meeting-House of Mr. *Burges*, levelled it to the Ground and made a Bonfire of it in *Lincoln's Inn-Fields*, March 1.

A Proclamation offering a Reward for apprehending him or them that demolished, or assisted to demolish *Russel's* and some other Meeting Houses, March 2.

At *Westminster-Hall* sixty-nine Peers declared *Dr. Sacheverell* guilty, and fifty-nine not guilty; upon which the Commons demand of them Judgment against the Doctor, which was this, That he should be suspended three full Years, that his two printed Sermons, and some other of his Pamphlets, should be burnt before the *Royal Exchange*.

170.

*Mr. Thomas Betterton*, the most celebrated Tragedian, died April 6.

*Dr. Sacheverell* magnificently entertained at the University of *Oxford*, for his being delivered (as they call it) from *Whiggish* Prosecution, May 1.

*Sir John Norris* defeats the Designs of the Duke of *Turfs* upon the Island of *Sardinia*, and obliges all the Forces to surrender Prisoners of War.

A Battle between *Charles III.* of *Spain* and his Rival King *Philip*, near *Almanara*, July 27.

*Charles III.* obtains a compleat Victory over *Philip* near *Saragossa*; and he entered that City the same Night in Triumph, August 9.

*Sir Gilbert Heathcote*, Knt. elected Lord-Mayor of *London*, Sept. 29.

The Duke of *Ormond* declared Lord Lieutenant of *Ireland*, Oct. 8.

The



The Abbot *De la Bourlie*, a Papist, upon his Trial stabs Mr. *Harley* at the *Cockpit*, but it did not prove mortal; however, he was committed to *Newgate* and died there, *Feb. 28.*

A Proclamation for all Papists to remove from the Cities of *London* and *Westminster*, *March 13.*

1711.

The Commons resolve, That fifty new Churches should be speedily erected in and about *London* and *Westminster*, upon such a Plan as to allow four thousand seven hundred and fifty Souls to each Church. This was a noble Act in such an expensive Time as this, *April 6.*

A Battle between the *Turks* and the *Muscovites* that lasted near three Days, the *Turks* gained the Advantage, *June 21.*

The Queen sent a Letter to the Archbishop of *Canterbury* to do all he can to suppress Irreligion, Prophaneness, and Infidelity, and desires him to exhort the inferior Clergy to lead more exemplary Lives, and be constant in their Duty, &c. *August 20.*

The *French* burnt several Men of War in the Bay of *Rio de Jenerio*, in *Brasil*; they took *St. Sebastian*, and brought off to the Value of seven Million of *Livres*, *Sept. 2.*

*Sir Robert Beachcroft*, Knt. elected Lord-Mayor of *London*, *Sept. 29.*

King *Charles III.* met with great Success in many Undertakings, by the Assistance of the Confederate Fleet he arrives at *Milan*, and is declared Emperor of *Germany* at *Frankfort*, under the Name of *Charles VI.* *Oct. 12.*

The Emperor writes to the *States General*, and desires them not to enter into Treaties of Peace with *France*, *Nov. 2.*

*Mr. Lockart*, by Order of the Commissioners of the Public Accompts, made a Report of some undue and unwarrantable Practices relating to the Monies allowed to carry on the late War. In this Charge or Report was set forth, That the Duke of *Marlborough* had taken to his own Use, out of the Bread contracted for, upwards of sixty-three thousand Pounds, that he had reserved also two and a half *per Cent.* out of the Pay of the Foreign Troops, amounting to above four hundred and sixty thousand Pounds, and that he allowed his Secretary, *Mr. Gardonnel*, to receive of the Contractors five hundred Ducats of Gold in every Contract, and *Mr Sweet*, Deputy Pay-Master in *Holland*, to deduct one *per Cent.* for all Money paid to the Contractors for Bread; and that *Robert Walpole*, Esq; when Secretary of War, received of the Contractors for Forage in *Scotland* to his own Use, five hundred Guineas, a Note for five hundred more; *Sir David Dalrymple* two hundred, and the Earl of *Leven* one hundred *per Annum* of the Contractors, &c. *Dec. 21.*

Upon Representation to her Majesty that the Duke of *Marlborough* had converted the Public Money to his own private Use, her Majesty turned him out of all Places, Posts or Employments, amounting to between sixty and seventy thousand Pounds per Annum, Dec. 30.

*Robert Walpole*, Esq; was also expelled the House.

The Duke of *Ormond* constituted Captain General of all her Majesty's Forces in *Great-Britain*, Jan. 1.

*Robert Walpole*, Esq; committed to the *Tower* for corrupt Practices.

Prince *Eugene* had his Audience of Leave; but he could not prevail upon her Majesty to continue the War any longer: She presented him with a Sword worth five thousand Pounds Sterling, March 13.

The *Mobocks*, a dangerous set of Fellows, who infested the Streets of *London*, breaking Windows and committing all Manner of Outrages, her Majesty offers one hundred Pounds for the taking of every *Mobock*, March 17.

1712.

A Suspension of Arms declared between *Great-Britain* and *France*, for four Months, August 27.

*Sir Richard Hoare*, Knight, elected Lord-Mayor of *London*, Sept. 29.

The *Dutch* refuse a Cessation of Arms, Sept. 30.

Duke *Hamilton* and Lord *Mobun* were killed in a Duel in *Hyde Park*, with Colonel *Hamilton* and Lieutenant General *Mackartney*, Nov. 15.

A Reward of five hundred Pounds offered for taking General *Mackartney*, Nov. 24.

1713.

Articles of Peace signed at *Utrecht* by the Ministers, the *States General*, *France*, and other Allies, except by the Ministers of the Emperor and the Empire.—The principal Articles relating to ourselves were—That the Protestant Succession should be continued, and that the King of *France* should remove the Pretender from his Dominions; that *France* and *Spain* never should be united under one Head, but their respective Kings should make Renunciations for themselves and Heirs, &c. &c. March 30.

Peace proclaimed with great Solemnity at *London*, May 5.

Dr. *Atterbury* created Bishop of *Rochester*, July 5.

Dr. *Henry Compton*, Lord Bishop of *London*, died in the eighty-first Year of his Age, July 7.

*Spain* by the Treaty of Peace signed at *Utrecht*, acknowledges the Protestant Succession and yields *Gibraltar*, *Minorca*, and *Port Mahon*, to *Great-Britain*, &c. &c. July 13.

An

An Act for building a new Church in the *Strand* near the *Maypole*, July 16.

An Act for raising one Million two hundred thousand Pounds for public Uses by circulating Exchequer Bills, and also to enable her Majesty to raise five hundred thousand Pounds to pay her own Domesticks.

The Magistrates of *Dunkirk* present an Address to her Majesty not to insist upon the Demolition of this Harbour, since it would ruin at least eighteen thousand Families; but this took no Effect, July 18.

Sir *Samuel Stanier*, Knight, elected Lord-Mayor of *London*, Sept. 29.

The Czar of *Muscovy* removed the vast Trade from *Archangel* to *Petersburgh*, transplanting therefrom out of *Moscow* above thirty thousand Persons, Nov. 15.

*Benedict Calvert*, only Son to Lord *Baltimore*, makes a public Recantation and renounces the Popish Religion, Jan. 3.

Dr. *John Sharp*, Archbishop of *York*, died Feb 14.

Dr. *Robinson*, Bishop of *London*, made Dean of the Chapel, March 8.

Sir *William Dawes*, Bart. was translated from *Chester* to the See of *York*, vacant by the Death of Dr. *Sharp*.

1714.

The Fortifications of the Harbour, and also the Citadel of *Dunkirk* entirely demolished, and Word sent thereof, Apr. 26.

The Princess *Sophia*, Electress and Dutches Dowager of *Hanover*, died in the eighty-fourth Year of her Age; whereupon an Order of Council was called to alter that Name in the Common-Prayer, inserting instead thereof, the Elector of *Brunswick*, May 28.

A Proclamation offering a Reward of five thousand Pounds for any one that should apprehend the Pretender, June 21.

Disturbances in *Ireland* relating to the Pretender, and twenty-one Persons are tried and convicted, July 6.

An Act for preventing the Growth of Schism, July 11.

An Act for rendering more effectual an Act to prevent the Growth of Popery and Popish Recusants.

Her Majesty was this Day, July 29, taken very ill with a great Heaviness and shooting Pains in her Head, whereupon her Physician agreed to cup her, which gave her present Ease, but her Indisposition returned and she was seized with a Fit of an Apoplexy, and upon letting of Blood she came in some Measure to herself again; but still she continued in a Sort of Lethargy for three Days, and died about seven in the Morning, August 1.

Queen *Anne* died in the fiftieth Year of her Age and the thirteenth Year of her Reign. She was second Daughter of

*James II.* by his first Wife *Lady Anne*, Daughter to *Edward Hyde*, Chancellor of the Exchequer. She was christened at *St. James's*, her eldest Sister the *Lady Mary*, and the Dutchess of *Monmouth*, were her Godmothers, and *Dr. Sheldon*, Archbishop of *Canterbury*, her Godfather. She was married *July 28, 1683*, to *Prince George of Denmark*, second Son to *Frederick III.* King of *Denmark*, by whom she had Issue,

1. A Daughter still born, *May 1684*. 2. *Lady Mary*, *June 2, 1685*. died *Feb. 1686*. 3. *Lady Anne Sophia*, *May 12, 1686*, died *Feb.* following. 4. *William Duke of Gloucester*, *July 24, 1689*, died *1700*. 5. *Lady Mary* born *Oct. 1690*, but soon died. 6. *George* born *August 17, 1692*.

## TABLE XIX.

## GEORGE I.

*George*, Elector of *Brunswick and Lunenburg*, succeeded to the Crown on the Demise of *Queen Anne*, by Virtue of several Acts of Parliament for securing the Protestant Succession, *August 1*.

*Queen Anne* opened, and her Bowels interred in *Westminster-Abbey*, *Aug. 3*.

The Duke of *Marlborough* made a triumphant Entry into *London*, but just by *Temple-Bar* his Coach broke down, and as he himself was partly broken in his Credit relating to the Use of the Public Money, it caused great Reflections; Noise, Huzzas, and Mobbing; however his Grace had no Hurt, *Aug. 4*.

King *George I.* proclaimed at *Edinburgh*, *Aug. 5*.

The King proclaimed at *Dublin*, *Aug. 6*.

The Pretender upon hearing of the Death of *Queen Anne*, removed from *Lorrain* to *Versailles* to consult the *French King*, but *Lewis XIV.* would not even see him, alledging the late Engagements he entered into with the *Hanoverian* and Protestant Succession; upon this the Chevalier returned to *Lorrain*, *August 14*.

*Queen Anne's* Remains privately interr'd in *Westminster-Abbey* by Order of the King, *August 24*.

King *George*, with the Prince his Brother, set out from *Hanover Aug. 31*, arrived at the *Hague Sept. 5*, and at *Greenwich, Sept. 18*.

An exceeding splendid Court at *Greenwich*; after which the Lord *Townsend* was sent to tell the Duke of *Ormond* that his Majesty had no further Occasion for his Service, and the Duke immediately returned to *St. James's Square*, without so much as seeing his Majesty, *Sept. 19*.

The Duke of *Ormond* removed from being Captain-General, *Sept. 20*.



Sir *William Humphreys*, Knt. elected Lord-Mayor of *London*,  
Sept. 29.

King *George* crowned at *Westminster* with great Solemnity,  
but a great many People were killed by the Fall of several Scaf-  
folds in the *Palace-Yard*, Oct. 20.

The King, Prince and Princess, accept of an Invitation to  
the Lord-Mayor's Feast; after which his Majesty gave to the  
Sheriffs one thousand Pounds for the Relief and Discharge of  
poor Prisoners and Debtors, Oct. 29.

Dr. *Radcliffe*, the noted and most eminent Physician, died.  
He left forty thousand Pounds to the University of *Oxford*  
to augment their Library; one hundred and fifty Pounds a Year  
to the Library Keeper, five thousand Pounds to the *University*  
College, six hundred a Year for two travelling Physicians, and  
six hundred a Year to St. *Bartholomew's* Hospital, &c. Nov. 1.

A Proclamation issued for putting the Laws in Execution  
against Papists, Non-jurors, and disaffected Persons, occasioned  
by the Pretender's Declaration and some Tumults at *Oxford*,  
Dec. 6.

An Order issued by his Majesty, prohibiting the Clergy to  
meddle with any State Affairs in their Sermons, Dec. 11.

A Fire happened in *Thames-Street*, which consumed upwards  
of one hundred and twenty Houses, and a vast Quantity of  
Merchandise, above fifty Persons perished in the Flames, and  
the Loss computed to be above three Million of Money, Jan. 13.

*Robert Nelson*, Esq; died; he was brought up to the Law,  
but was more particularly eminent for his Divinity, having  
wrote many useful Books of great Learning and Piety, well  
known to this Day, Feb. 16.

Prince of *Wales* chosen Governor of the *South-Sea* Company,  
Feb. 18.

Dr. *Gilbert Burnet*, Bishop of *Salisbury*, died March 17.

1715.

A total Eclipse of the Sun about nine this Morning, the  
Darkness was so great for full three Minutes that the Stars ap-  
peared quite plain, and Birds and other Animals discovered a  
surprizing Fear and Dread, April 22.

The Duke of *Ormond* retires to *France*, August 6.

*Lewis XIV.* King of *France* died in the seventy-seventh  
Year of his Age and seventy-third of his Reign; and *Lewis*  
his Grandson was proclaimed under the Name of *Lewis XV.*  
Aug. 20.

An Act for building fifty new Churches read and confirmed,  
and to which is enacted an Act for providing for the Ministers  
thereof, and for rebuilding the Parish Church of St. *Mary Wool-*  
*noth* in the said City, Sept. 21.

Sir *Charles Peers*, Knight, elected Lord-Mayor of *London*,  
Sept. 29. The



The honourable *James Murray* landed near *Edinburgh*, joined the Earl of *Marr* at *Perth*, and from four thousand soon increased to ten thousand, and took Possession of *Kilkardy* and several other Towns, *Oct.* 4.

One *Forster* accepted the Post of being General of the Pretender's Forces, assembled his Troops at *Greenrig* in *Northumberland*, and took Possession of several Places; and being attended by a great Number of *Northumbrians* he marched to *Morpeth*, took Possession of it, and was joined by seventy *Scotch* Gentlemen, *Oct.* 10.

*Sir William Wyndham*, Earl of *Scardal*, *Sir Richard Vyvyan*, Lord *Dunbar*, *Sir Francis Warre*, and *Sir Marmaduke Constable*, Barts. were taken in the Rebellion and brought to Town, *Oct.* 17.

*Joseph Sulvian*, alias *Joseph Silver*, *Robert Whitty*, and *Felix Hara*, convicted of enlisting Men in the Pretender's Service, and on the 28th were hang'd at *Tyburn*, *Oct.* 18.

The Earl of *Derwentwater*, the Lord Viscount *Kenmure*, with the Earls of *Nethisdale*, *Carnwath*, and *Winton*, join with Mr. *Forster* with two hundred *Scotch* Horse, *Oct.* 19.

Mr. *Forster*, with a Number of *Northumbrians*, join *Mackintosh* at *Deuse*, near *Berwick*, and opens his Commission, and being joined by several Detachments of *Scots* and a large Body of *Northumbrians*, marched to *Lancaster*, *Nov.* 1.

General *Willis* and General *Carpenter* attack the Rebels under *Forster*, &c. at *Preston*, where was a severe and bloody Battle: There were about two thousand Rebels killed, and nearly fifteen thousand taken Prisoners, among whom were General *Forster*, the Earls of *Derwentwater*, *Nithisdale*, *Winton*, and *Carnwath*, Lord *Widrington*, Lord Viscount *Kenmure*, Lord *Nairn*, seventy-two *English* Gentlemen, and one hundred thirty-eight *Scotch* Officers, *Nov.* 13.

Messrs. *Dorrel*, *Gordon*, and *Ker*, tried and convicted for High Treason at the King's Bench Bar; and were executed the 7th of *December* following, *Nov.* 24.

The principal Prisoners brought to *London*, they were pinion'd at *Barnet* and led so through the City, so also were the seven Peers; they were committed to several Prisons, and the Peers to the Tower, *Dec.* 9.

Dr. *Tho. Tenison*, Archbishop of *Canterbury*, died *Dec.* 14.

Dr. *Wake* nominated Archbishop of *Canterbury*, and Dr. *Gibson* succeeded him in the Bishoprick of *Lincoln*, *Dec.* 17.

Dr. *Benj. Hoadley* nominated Bishop of *Bangor*, *Dec.* 21.

The Pretender lands at *Peterhead* near *Aberdeen*, *Dec.* 25.

A severe hard Frost that the *Thames* was so frozen that all Manner of Diversions were used upon the Ice; the Snow lay in many Places full a Yard deep, and many Post-Boys and others were frozen to Death, *Dec.* 31.

The

The Pretender makes his Public Entry into *Perth*, *Jan. 10.*

The Queen of *Spain* brought to Bed of a Son, who was named *Carlos*, *Jan. 13.*

Orders of Council for executing the Earls of *Derwentwater* and *Nithisdale*, and Lord Viscount *Kenmure*; *Nithisdale* made his escape out of the *Tower*, but the other two were beheaded on *Tower-Hill*, *Feb. 24.*

There were about one hundred and five other Persons found guilty of the *Preston Plot*, among whom were many Persons of Note, some of which were executed, some transported, and many died in Prisons thro' Want and the Extremity of the Weather.

This Evening a very surprizing Phænomenon was seen, it appeared like a large Body of Fire and Light towards the N. East, then formed itself into many Pillars perpetually flashing till about three in the Morning, to the great Consternation of all that saw it, *March 6.*

1716.

*Hans Sloane*, of *Chelsea*, M. D. created a Baronet, *April 3.*

Colonel *Oxburgh* was executed at *Tyburn*, and his Head set upon *Temple-Bar*, *May 14.*

*Richard Gascoigne*, Esq; executed at *Tyburn*, *May 25.*

Sir *Richard Onslow*, Bart. created Baron *Onslow* of *Onslow*, and *West Clandon*, *June 25.*

His Royal Highness *Ernestus Augustus*, Duke of *Brunswick*, *Lunenburg*, &c. (Brother to his Majesty) created Duke of *York* and *Albany*, and Earl of *Ulster*, *June 29.*

*Thomas Forster* escaped out of *Newgate*, and *Pitt* the Keeper indicted for it, *July 6.*

The learned and orthodox Dr. *Robert South* died in the eighty-third Year of his Age, *July 8.*

The Rev. Mr. *John St. Quintin* convicted at *Norwich* Assizes for asserting, that the Pretender was landed in the *West* with fifty thousand Men, and for drinking Success to him; he was sentenced to pay a Fine of twenty Marks, to be imprisoned one whole Year, and find good Securities for three Years: Also Mr. *Matthew Fern* was convicted for saying King *George* was nothing but a Turnip Hougher; and one Mr. *Shirley*, at the same Time, for saying that King *George* had no more right to the Crown than he had, *August 2.*

Prince *Eugene* gains a compleat Victory over the *Turks* near *Peter-Waradin*; in which the Grand Vizir himself and the Aga of the Janizarians were killed, *August 5.*

A very strong westerly Wind drove back the Tide so much, and drove forward the ebbing Water, that the *Thames*, both above and below Bridge, was dry, except just in the Middle, like a Ditch, *Sept. 14.*

James

*James Bateman*, Knight, elected Lord-Mayor of *London*, Sept. 29.

*Dr. Welton*, Rector of *St. Mary Whitechapel*, deprived for Disaffection, and *Dr. Shippen* of *Brazen-Nose*, *Oxford*, succeeded him, Oct. 16.

About eleven this Night a Fire happened in *Nightingale Lane*, *Limehouse*, which burnt upwards of one hundred and fifty Houses, Dec. 4.

*Bedmayne* and *Dalton*, Printers, imprisoned and fined for Libels, Dec. 10.

The Prince of *Wales* gives one thousand Pounds to the Sufferers at the Fire at *Limehouse* the 4<sup>th</sup> Inst. Dec. 22.

The Czar of *Moscow* comes to *Holland*, Dec. 30.

A large Fleet were now fitting out under the Notion of an Invasion and Insurrection, the Command was given to Sir *George Byng*, Feb. 14.

The Court receives from *France* full Assurance that the Pretender had no great Encouragement from them, and declared he was removed from beyond the *Alps*.

1717.

*James Earl of Berkeley*, *Matthew Aylmer*, Esq; Sir *George Byng*, *James Cockburn*, and *William Cbetwynd*, made Lords Commissioners of the Admiralty, April 16.

The Duke of *Newcastle* made Lord Chamberlain of his Majesty's Household, and his Brother Colonel *Pelham*, Vice-Chamberlain, April 20.

The Government order five thousand Pounds to the Dissenters to pay them for Damages done to their Meeting-Houses at the Insurrection in *Salisbury-Court* last Year, and in other Places, April 27.

Prince *Eugene* gains a compleat Victory over the *Turks* near *Belgrade*, August 5.

*Dr. William Lloyd*, Bishop of *Worcester*, died in the ninety-first Year of his Age; he was one of the seven sent to the Tower in the Reign of King *James II.* August 30.

*Dr. Welton*, late Rector of *St. Mary Whitechapel*, with about two hundred and fifty of his Congregation that were Nonjurors, refuse to take the Oaths, and most of them were prosecuted, Nov. 11.

*George William*, Son of the Prince of *Wales*, born Nov. 2, christened Nov. 28.

The young Prince *George William* died, Dec. 6.

*James Shepherd*, a Lad between seventeen and eighteen, Apprentice to a Coach Painter, convicted of High Treason in conspiring the King's Death: He looked upon it as meritorious to murder the King, and continued so to his very Execution at *Tyburn*, which was March 17.

1718.

1718.

A Pension of four thousand Pounds *per Annum*, settled on the Lord Chancellor *Parker* for Life, *May 24*.

The Czar of *Moscow* caused his eldest Son, *Alexis Petrovitz*, to be condemn'd to Death; but he died before the Execution, *June 26*.

Sir *George Byng* fell upon the *Spanish Fleet*, consisting of twenty-six Men of War, near *Syracuse*, and took and destroyed fifteen, *July 31*.

The Rev. Mr. *Edward Byss* convicted at *Wells* in *Somersetshire*, for saying that *King George was an Usurper, and that we had been without King or Parliament for thirty Years*. He was adjudged to stand twice in the Pillory, to forfeit six hundred Pounds, and find good Securities for Life, *Aug. 21*.

Dr. *Shippen* chosen Vice-Chancellor of *Oxford*, *Sept. 26*.

*John Ward*, Knight, Lord-Mayor of *London*, *Sept. 29*.

*Charles XII.* King of *Sweden*, one of the bravest and most active Princes in *Europe*, (as appears by the History of his Life) kill'd by a Musket-Shot from a Fort at *Frederickshall* in *Norway*, *Nov. 30*.

War declared against *Spain*, *Dec. 16*.

Baron *Gortz* beheaded at *Stockholm*, *Feb. 20*.

The Duke of *Ormond* being now quite in the Interest of the Pretender, a Proclamation is issued promising a Reward of five thousand Pounds for apprehending him, for every other attainted Peer one thousand Pounds, and for every Gentleman attainted five hundred Pounds, *March 15*.

A Declaration from his Majesty, that all Prizes taken from *Spain* during the War, should be divided among the Seamen, *March 23*.

1719.

The Pretender arrived at *Madrid*, was met by the Duke of *Ormond*, and received there with all Honour and Respect, *March 25*.

The *French* invade *Spain* by Land, they took *Port Passa*, and burnt six Men of War upon the Stocks which were just finished, *April 10*.

*Redmayne* the Printer died in *Newgate*, *April 11*.

*Colchester River* made navigable by an Act of the 9th of *William*, now enlarged for cutting it wider and cleansing it down to *Wivenhoe*, being about three Miles.

Her Grace *Erengard Melosina*, Dutchess of *Munster*, created Baroness, Countess and Dutchess of *Great-Britain*, viz. Baroness of *Glastenbury*, Countess of *Fewersham*, and Dutchess of *Kendal*.

The King embark'd for *Holland*, *May 9*.

Th



The King's Forces gain a Victory over the *Scotch Rebels*, &c. and the *Spaniards* at *Glenfields*; and about three hundred *Spaniards* and one thousand *Highlanders* submit at Discretion, *June 10.*

The *Moscovites* make a Descent in *Sweden*, and burnt and destroyed the Country in a terrible Manner, *July 11.*

Captain *Johnson* being joined by the *French Fleet* lay before *St. Sebastians*; they attacked *St. Antonio*, destroyed three large Men of War upon the Stocks, and burnt a vast Quantity of Timber and other Materials for Ship building, *Aug. 11.*

The *Moscovites* again burn and destroy the *Swedish Coast* in a most dreadful Manner, and particularly they burn *Mikopping*, the third principal Town in the Kingdom, *Aug. 15.*

Sir *George Thorold*, Knt. and Bart. elected Lord-Mayor of *London*, *Sept. 29.*

Lord Viscount *Cobham* enters the Harbour of *Vigo*, the Land Forces make a Descent and the Castle surrenders; in which he found many thousand small Arms, &c. which were intended for a Descent upon *Great Britain*, *Oct. 1.*

Lord *Cobham* takes Possession of *Ponte Vedra*, where he found above four thousand small Arms, and three hundred Barrels of Gun-Powder, &c. *Oct. 12.*

The Castle of *Messina* surrenders to the *Imperialists*, and Sir *George Byng* destroyed in the Harbour four large Men of War and took three, *Oct. 19.*

King *George* arrives at *St. James's* from *Hanover*, *Nov. 13.*

Mr. *Flamsteed*, the great Astronomer died, and Dr. *Edmund Halley* succeeded him in the Royal Observatory in *Greenwich-Park*, *Dec. 31.*

1720.

An Act for making the River *Derwent*, in the County of *Derby*, navigable: Also for making the River *Douglas*, alias *Astland*, navigable from *Ribble* to *Wigan*, in the County of *Lancaster*: Likewise the River *Idle* from *Eastretford* in the County of *Nottingham*, to *Bawtry Wharf* in the County of *York*, *April 7.*

The King embarks at *Greenwich* for *Holland*, and arrived there the next Day, *April 15.*

Upon the King's going abroad many that accompanied him drew their Money out of the *South-Sea*; and presently after, almost all the Nation, viz. Whig and Tory, Clergy and Laity, and even many Ladies who had Money, neglected their several Professions and turned Stock-Jobbers, and pursued some Bubble or other; and it was proposed to raise three hundred Million Sterling from *June 27* to *Sept. 23.* \*

Died

\* Many of the most eminent Goldsmiths and Bankers in *London* having lent large Sums on the *South-Sea Stock*, were obliged to shut up Shop

Died of the Plague at *Marseilles* to this Day eighteen thousand,  
Sept. 8.

The King gave orders, that all such of the Directors of the *South-Sea* Company as were in, or had any Employment under the Crown, should be immediately discharged his Service,  
Jan. 11.

The Sub-Governor, Deputy-Governor, and twenty-four Directors, with Mr. *Knight* the Cashier of the *South-Sea* House, were sent for to the House of Lords, their Accounts examined into, and they were told by the House that they had prevaricated with them, by giving in false Representations; that they were guilty of a notorious Breach of Trust, and ought to make good the Losses arising from their fraudulent Management,  
Jan. 12.

A secret Committee, appointed by the House of Commons, sent to the *South-Sea* House, took Possession of it and all their Books, upon which Mr. *Knight*, their Cashier, absconded and fled to *Calais*, and a Reward of two thousand Pounds was offered for apprehending him, Jan. 14 to 23.

Mr. *Robert Knight* stopped by Order of the Marquis *Deprio* at *Tirlemont*, and committed Prisoner to *Antwerp* Castle, Feb. 3.

Sir *John Blount*, chief Projector of the *South-Sea* Bubble, sent for, but refuses an Examination.

Colonel *Charles Churchill* sent to *Vienna* in his Majesty's Name to the Emperor, that he would be pleased to deliver up Mr. *Knight*, Prisoner in the Castle of *Antwerp*, Feb. 13.

A secret Committee appointed to look into the *South-Sea* Company Affairs, and made their Report, that the following Stock was taken in (at 150 to 180) for the following Persons,  
*viz.*

For the Earl of <i>Sunderland</i> , at the Request	}	50,000 <i>l.</i>
of <i>James Craggs</i> , Sen. Esq;		
For the Dutches of <i>Kendal</i> , - - -	-	10,000 <i>l.</i>
For her two Nieces, - - -	-	10,000 <i>l.</i>
For the Countess of <i>Platen</i> , - - -	-	10,000 <i>l.</i>
For Mr. <i>Craggs</i> , Sen. - - -	-	30,000 <i>l.</i>
For <i>Charles Stanhope</i> , Esq; - - -	-	10,000 <i>l.</i>
For the Sword Blade Company, - - -	-	20,000 <i>l.</i>

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140,000 *l.*

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Besides this Sum as above it appeared, that Mr. *John Aislaby*, Chancellor of the Exchequer, had caused a Book to be burnt, wherein the Balance between him and Mr. *Harwes* was stated,

Shop and abscond: And 'tis reported that not less than twenty thousand Families (in Town and Country) were ruined by this Scheme.

and gave the said *Harves* a Discharge for eight hundred forty-two thousand Pounds, upon which the House resolved, That the said *John Aislaby* had promoted this wicked Scheme, with a View of exorbitant Profit, to the Detriment of Numbers of his Majesty's good Subjects, the Ruin of the Public Credit and Trade of the Kingdom: And they farther resolve he should be expell'd the House, and be committed to the *Tower*, &c. *March 2.*

Pope *Clement XI.* died, aged seventy two.

The River *Weaver* made navigable from *Frodsham Bridge* to *Windford Bridge*, in the County of *Chester*; and the River *Kennet* from *Reading* to *Newbury*, in *Berks*, *March 23.*

1721.

The Right Hon. *Robert Walpole*, Esq; made Chancellor and Under Treasurer of the Exchequer, and *Henry Pelham*, Esq; one of the Commissioners for executing the Office of Treasurer, *April 2.*

The Right Hon. *Daniel Finch*, Earl of *Nottingham*, wrote a most noble Piece against *Whiston*, in Defence of the Trinity, for which he received the Thanks of the whole University of *Cambridge*, *April 22.*

An Order of Council for suppressing the blasphemous Clubs, known by the Name of the *Hell Fire Clubs*, *April 28.*

The Commons resolve, That all the real and personal Estate of *James Craggs*, Esq; be seized and taken and applied towards the Relief of the Sufferers in the *South-Sea* Affair, by his and Knight's exorbitant Profits and Frauds, *May 1.*

A great Mob of many hundreds of the Proprietors of both Sexes, came to the Doors of the House of Commons, demanding Justice; they tore off Part of the Comptroller's Coat as he passed them, and the House was forced to send for Help to protect them, and they dispersed by saying, *That they had first pick'd their Pockets, and now want to send them to Prison for complaining*, *July 31.*

*Dr. Benj. Hoadley*, Bishop of *Bangor*, translated to the See of *Hereford*, *Sept. 9.*

*Matthew Prior*, Esq; Fellow of *St. John's College*, *Cambridge*, died *Sept. 15.*

*Mr. Knight*, Cashier of the *South-Sea Co.* made his escape out of the Castle of *Antwerp*, *Sept. 28.*

The Czar of *Moscow* took upon him the Title of Emperor of all *Russia*, *Oct. 22.*

Great Debates arise in the House concerning the *French* being admitted to build Men of War in the Ports of *Great-Britain*, and it was referred to the twelve Judges; but to the Honour of *Baron Montague*, one of them, he only opposed it; proved it illegal

illegal and pernicious, upon which Lord *Cowper* moved that he might bring in a Bill to prevent it for the future, *Jan. 12.*

An Act for granting the People called *Quakers*, a Form of Affirmation, removing the Difficulties they objected to relating to taking an Oath, *Feb. 12.*

An Act for making the River *Eden* navigable to *Bank End*, in the County of *Cumberland*.

An Act for the repairing the Road from *Whitechapel Church*, *London*, to *Stenfield*, and the farther Part of *Woodford* to *Epping*, in *Essex*, *March 7.*

Great Rejoicings on Account of dissolving the Septennial Parliament, *March 13.*

1722.

Princess *Amelia* and *Carolina* inoculated for the Small-Pox, *April 17.*

*John Churchill*, Duke and Earl of *Marlborough*, Marquis of *Blandford*, Lord *Churchill* of *Sandridge*, Baron of *Aymouth*, Prince of the Holy Roman Empire, Captain General of his Majesty's Forces, Master General of the Ordnance, Colonel of the first Regiment of Foot Guards, Privy-Counsellor and Knight of the most Noble Order of the Garter, died at *Windsor* this Morning about four o'Clock, in the seventy-fourth Year of his Age, \* *June 16.*

His Grace *John Duke of Marlborough* buried with great Pomp and Solemnity. The Procession began about half an Hour past Twelve at Noon from his House at *St. James's*, was carried through the lower to the upper *Park*, thence to *Hyde-Park Corner*, through *Piccadilly*, down *St. James's Street*, through *Pall-Mall*, and by *Charing-Cross* to *Westminster-Abbey*. The *Tower Guns* fired every Minute during the Procession, *August 9.*

*August 28*, his Majesty took a Tour from *Kensington*, accompanied by the Prince of *Wales*, went to the Duke of *Bolton's* at *Hackwood*; on the 29th he went to *Salisbury*, supp'd and lodg'd at the Bishop's Palace; the 30th he review'd the Forces on the Plain, went to *Salisbury* the same Evening; on the 31st went to *Portsmouth*, and the same Day to the Earl of *Scarborough's* at *Stanstead*, lay there that Night, and returned to *London*, *Sept. 1. †*

*Christopher*

\* Lord *Churchill* was one of the most successful Generals that shall be found in History, he had amassed the greatest Estate of any Subject in the three Kingdoms; having served under *Charles II.* *James II.* *Queen Anne*, and *George I.* See *Rapin*, *Voltaire*, *Howel*, and *Salmon*.

† *N. B.* His Majesty's Clemency remarkably appeared in this Progress, for he bestowed many Gifts upon a Variety of Poor, releasing also many Criminals, and at his own Expence, all Debtors in every



*Christopher Layer*, Esq; and *Charles Earl of Orrery*, and *William Lord North* and *Grey*, committed to the Tower for High Treason, *Sept.* 20, 28 and 29.

*Sir Gerard Conyers*, elected Lord-Mayor of *London*, *Sept.* 29.

At a Convocation this Day *Dr. George Stanhope*, Dean of *Canterbury*, was chosen Prolocutor of the Lower House, *Oct.* 12.

*Lewis XIV.* of *France*, crown'd at *Rheims*, *Oct.* 15.

Advice came this Day of a terrible Storm near the *Cape of Good Hope* in *Africa*, in which perished three *English*, six *Dutch*, and one *French Ship*, with many Souls, *Nov.* 9.

Advice also came next Day, that on the 28th of *August* last, a most terrible Storm and Hurricane happened at *Jamaica*; by which twenty-eight Ships were cast away, and full one third Part of the Town of *Port-Royal* destroy'd by the Sea breaking in upon them.

Many Declarations were dispersed in *England* by the Friends of the Pretender, (*James III.*) one of which was produced sign'd by the Pretender himself, offering Terms and Conditions to his Majesty: The King dispatch'd Lord Viscount *Townshend* to the House of Peers with it; and the Lords and Commons, after taking a fair Copy of it, order'd it to be burnt by the Hands of the Hangman, *Nov.* 16.

A Bill brought in (after some Opposition) and passed for raising one hundred thousand Pounds on Papists and popish Recusants, *Nov.* 23.

The famous *Sir Christopher Wren* died in the ninety-first Year of his Age, *Feb.* 25. \*

1723.

The Bishop of *Rocheſter* sent to the Tower, and the Lords resolve, That a most wicked and detestable Plot has been, and is still carrying on, by the said Bishop of *Rocheſter*, *Christopher Layer*, *Charles Earl of Orrery*, &c. to destroy the King and Prince, to subvert our Religion and happy Constitution, and bring in a Popish Pretender, *April* 24.

The King embarks for *Holland*, *June* 3.

*Dr. Benj. Hoadley*, Bishop of *Salisbury*, translated to the See of *Wincheſter*, *Sept.* 1.

Town he pass'd through; and at *Salisbury* only he gave almost three thousand Pounds to release insolvent Debtors, and for other good Uses and Purposes. See *Tindal* and *Salmon*.

\* This ingenious Architect, after the Fire of *London* 1666, was constituted Surveyor-General for rebuilding the Cathedral of *St. Paul's*, the Parochial Churches, and other the most noted Buildings in the City, which he lived to see finished. He was one of the first Promoters of the Royal Society, and was elected President among them in 1680; and remained Surveyor-General of all the Royal Works till the Year 1713; being then displaced most ungratefully by a Party.

Dr.

Dr. Mather chosen Vice-Chancellor of *Oxon*, in the Room of Dr. Shippen, Nov. 6.

Philip V. King of *Spain* resigns his Crown to his eldest Son, Don Lewis, Jan. 4.

Pope Innocent XIII. died, Feb. 25.

An Act for compleating St. Martin's Church, and rebuilding St. Botolph's Bishopsgate, London, March 19.

Mr. Henry Voght naturalized.

1724.

Henry Pelham, Esq; made Secretary of War of all his Majesty's Forces in *Great-Britain*, March 28.

Bibles and Common Prayer Books ordered to be printed on better Paper, by Order of Council, that the Prices be affixed to the Title-Page, and that the Correctors of the Press be such as were approved of by the Archbishop of *Canterbury*, and the Bishop of *London*, April 24.

A severe Edict published in *France* against the Protestants, May 14.

Cardinal Vincent Maria Ursini elected Pope by the Name of Benet XIII. May 16.

Dr. Henry Sir Sacheverel died, whose Impeachment in the Reign of Queen Anne made a Change in the Ministry, June 5.

Mr. Wood had a Patent for coining Irish Halfpence, July 24.

A violent Persecution in Pursuance of the Edict published in *France*, May 14, May 25.

Lewis I. King of *Spain* died of the Small-Pox the eighth Month of his Reign, and his Father Philip, late King, at the Instance of the Grandees, resumed the Government again, August 20.

Sir George Mertins, Knight, elected Lord-Mayor of *London*, Sept. 29.

Dr. Prideaux, Dean of *Norwich*, (Author of that valuable Work, *The Connexion of the Old and New Testament*, &c.) died, Nov. 1.

Many Protestants executed at *Thorn* in *Poland*, their Church taken away and Goods confiscated; and notwithstanding almost all the Protestant Powers in *Europe* threatened *Poland* with a War, in Case the Sentence of several of the Protestants was not reversed, it amounted to very little Purpose, Nov. 7 to 12.

John Shepherd, a notorious Felon, executed at *Tyburn*; he broke out of the strongest Part of *Newgate* several Times, to the Amazement of the Keepers, Nov. 16.

Thomas Guy, Esq; formerly a Bookseller, and Member of Parliament for *Tamworth*, erected an Hospital in the Borough of *Southwark*, (known by the Name of Guy's Hospital) and lived to see it almost finished: He died this Day in the eightieth Year of his Age, and left to the Hospital a Benefaction of two

hundred thousand Pounds, with many other Charities, and one thousand Pounds each to fifty of his Relations, *Nov. 18.*

*Peter* the first, Emperor of *Great Russia*, died, and was succeeded by his Empress *Catherine Alexewina*, *Feb. 8.*

*Sir John Pratt*, Lord Chief Justice of the King's Bench, died with a severe Fit of the Stone, (which he had sustained with Patience for many Years) and being open'd, there were three large Stones found in or near the Neck of the Bladder, one of which weighed full seven Ounces and a half, *Feb. 14.*

An Act for repairing the Road from *Enfield* to *Hertford*, from *London* to *Tunbridge* and *Cambridge*, and for rebuilding *Stanford Bridge* in the County of *York*, *March 24.*

1725.

*Sophia-Charlotte Platen*, Baroness of *Kilmanseg* and Countess of *Darlington*, in the Bishopric of *Durham*, a great Favourite of the King's, died *April 20.*

*Thomas Parker*, Earl of *Macclesfield*, impeach'd of Misdemeanors for selling the Offices of the Masters in Chancery at extravagant Rates, and suffering them to embezzle the Suitors Money; the Charge was fully proved upon his Trial, (which lasted twenty Days) and he was fin'd thirty thousand Pounds, *May 6.*

The King allows one thousand Pounds *per Annum* to the Presbyterian Itinerant Preachers in *Scotland*, *May 14.*

The King embarks at *Greenwich* for *Hanover*, *June 3.*

*Thomas* Earl of *Macclesfield* committed to the Tower, *May 27.*

*Dr. Peters* and *Dr. Stephens* were chosen travelling Physicians for ten Years, *viz.* five at Home and five Abroad, and to be allowed three hundred Pounds *per Annum* each, *July 5.*

*Thomas* Parker, Earl of *Macclesfield*, paid his Fine of thirty thousand Pounds, and was released from the Tower, *July 22.*

The Duke of *Orleans*, in the Name of *Lewis XV.* of *France*, (and as his Proxy) married the Princess *Mary Leezinskie*, Daughter of *Stanislaus* King of *Poland*, *August 4.*

*Lewis XV.* married to *Mary Leezinskie* at *Fontainbleau*, *Aug. 25.*

A Treaty, called the *Hanover Treaty*, between *England*, *France*, and *Prussia*, *Sept. 3.*

*Sir Francis Forbes*, Knt. elected Lord-Mayor of *London*, *Sept. 29.*

*Maximilian-Mary-Emanuel*, Elector of *Bavaria*, died *Feb. 1.*

1726.

The Sale of the *South-Sea* Directors Estates amounted to one Million nine hundred eighty-four thousand three hundred fifty-two Pounds; and the Disbursements allowed to them were eight hundred forty-five thousand three hundred seventy-six Pounds, and there remained in Hand, after some other Charges, about eight hundred and nine thousand Pounds.

An Act for repairing the Roads from *Glocester*, *Hertford*, and *Worcester*; from *Lincoln* to *Nottingham*, from *Tyburn* to *Uxbridge*

*Uxbridge and Tewksbury, from Worcester to Droitwich, from Liverpool to Prescot, from Sherfield to Harwich, and from Gloucester to Stow, April 26.*

*John Henley, M. A.* by a Licence from the Quarter Sessions, open'd a Conventicle in *Newport Market*, near *Lincoln's Inn*, and open'd Lectures of Oratory (as he call'd them) every *Sunday Evening* about six o'Clock, but no body was admitted without paying a Shilling, or Six-pence, according to their Ability \*, *July 16.*

*Duke Maximilian-William*, Brother to King *George*, died in the sixtieth Year of his Age at *Vienna*, *July 16* †.

A most dreadful Earthquake happened at *Palermo* in *Sicily*; a great Part of the City was destroyed, and Numbers buried in the Ruins, *August 21.*

A terrible Hurricane in *Jamaica*, which destroyed several Plantations and above eighty Ships, *Oct. 22.*

*Sophia Dorothy*, Queen of *Great-Britain*, died at the Castle of *Ahlen*, *Nov. 2.*

*James Vernon*, Esq; Secretary to King *William*, died in the eighty third Year of his Age, *Jan. 31.*

The *Spaniards* this Day invest *Gibraltar*, and open the Trenches before it, *Feb. 22.*

The *Flotilla* arrived at *Cadix* with eighteen Millions of Pieces of Eight, *March 4.*

*Sir Isaac Newton*, Knt. Master of his Majesty's Mint, President of the Royal Society, and (in general) allow'd to be the greatest Philosopher and Mathematician in the known World,

\* We must not omit, in this Part of our small Chronology, giving some Account of *Dr. Henley's* Proceedings. He pretended at first to open his Chapel with Things sacred; but he at last seem'd to ridicule every Thing relating to revealed Religion.—Sometimes he entertained his Audience with political and national Affairs, mix'd with an inconsistent Series of Jargon and Nonsense, (as appears from the ridiculous stuff that he daily advertised in the News-Papers, of what he was to treat of the *Sunday* following).—He was several Times taken up and examined for his blasphemous Speeches, and his disaffected Talk and Indecencies; but he always pleaded that he was a true Friend to Orthodoxy, and that his System tended to prevent Corruption.—Thus by a certain Cunning he kept himself from Imprisonment; but had not quite Sense enough to keep himself from great Charges in several Indictments, &c.—In short, he was one of the remarkable Men and greatest Oddity of the Age.—He was a Scholar, but turned Learning into Ignorance itself, and in the latter Part of his Life his Oratory of a *Sunday* was fill'd with very little else but a Crowd of Ignoramus's, who paid their Money to be admitted to laugh at the Doctor to his Face, and he at them.—His Course of Life was much the same, seeking Applause among the ignorant and disaffected; thus he lived, and thus he died in the Year 1757.

† *N. B.* He lived a Protestant and died a Roman Catholic.

died



died this Day in the eighty-fifth Year of his Age. [His Corps lay in the *Star Chamber* till the 28th, and was buried in *Westminster-Abbey*] *March 23.*

1727.

An Act for repairing the Road from *Wigan* to *Preston* and *Warrington*, from *St. John's Bridge*, in the County of *Glocester*, to *Cirencester*; from *Studley Bridge* in *Wilts*, to *Toghill* in the County of *Glocester*; from *Birmingham* to *Warwick*, *Stafford*, and *Worcester*, &c. and for draining *Haddenham Level* in the Isle of *Ely*, and for improving the Navigation of the River *Dun* in the County of *York*.

The Czarina *Catherina Alexowina*, Empress of *Russia*, died in the thirty-ninth Year of her age, and was succeeded by Prince *Peter Alexowitx*, (Grandson to the late *Peter the Great*) *May 6.*

An Act for making navigable the Rivers *Wye*, *Lug*, and *Ouze*, *May 15.*

Preliminary Articles of Peace signed at *Paris* by the Ministers of the Emperor, *Great-Britain*, *France*, *Spain*, and the *States General*, *May 20.*

The King embark'd at *Greenwich* for *Hanover*, *June the 3d*, and landed at *Holland*, *June 7.*

*George I.* King of *Great-Britain*, Elector of *Brunswick Lunenburg*, &c. died at *Osnaburg* in *Germany* this Night, being in the sixty-eighth Year of his Age and thirteenth Year of his Reign, *June 10 \**.

\* His Majesty landed at *Holland* on the 7th of *June*, went from *Vaert* to *Utrecht* by Land; arrived at *Delden* on the 9th in good Health, having among other Things eat Part of a Melon. On *Saturday* the 10th he set out about three in the Morning, and about five felt some griping Pain; and being come to *Linden*, where a Dinner was provided, he could eat nothing; but was let Blood, and had proper Remedies given him. However he was very desirous of reaching *Hanover*, and therefore bid them drive with all Speed, and presently fell into a Doze, and lay in the Arms of a Gentleman who was alone with him in the Coach; to whom he said in *French*, *I am a dead Man*. About ten at Night he arrived at the Duke of *York's* Palace at *Osnaburg*, where he was bled in the Arm and Foot, but to no Purpose; for his Lethargy encreased and he died about Midnight.

His Majesty was Son of *Ernest Augustus*, (Duke of *Brunswick Lunenburg*, the first Elector of *Hanover*, and great Treasurer of the Empire, who died 1698) and of the Princess *Sophia*, Daughter of *Frederick V.* Elector *Palatine*, and of Princess *Elizabeth*, Daughter of *James I.* King of *England*. He ascended the Throne of *Great-Britain* the first of *August* 1714, was crowned the 20th of *October* following, having reigned twelve Years ten Months and ten Days. He married the Princess *Sophia-Dorothy*, Daughter of *George-William* Duke of *Zell*, who died *November 22*, 1726; by whom he had Issue *George-Augustus*, Prince of *Wales*, born the 30th of *October* 1683, and *Sophia-Dorothy*, born the 16th of *March* 1687, and married to *Frederick-William* King of *Prussia*, 1706,

T H E

# BOOK OF KNOWLEDGE. [93]

## TABLE XX.

George II. proclaimed King the 27th of June, 1727.

Duke of Newcastle and Lord Townshend, Secretaries of State; Sir Robert Walpole Chancellor of the Exchequer.

Arthur Onslow, Esq; chosen Speaker, January 23d, 1727 8.

1728.

The Spaniards continue their Depredations in America, January, 1728-9, and Enquiry was made why Admiral Hosier's Fleet lay inactive in that Part all the Time.

1729.

His Majesty purchased Carolina for 800000 l.

1730.

Peter, the young Czar, died of the Small-pox, and Pope Benedict XIII. died the same Year, and Clement XII. succeeded him.

1731.

All Law Proceedings ordered to be in English instead of Latin; Pamphlets against Sir Robert Walpole were continually coming out; and the famous Paper called the *Craftsman* now made its first Appearance.

1732.

A great Dispute in the House for and against a Standing Army, which was carried to great Height on both Sides.

The Prince Royal of Prussia married the Princess of Bevern.

1733.

Sir John Barnard plainly proved, that an Imposition of high Duties on Sugars, or any other Thing from foreign Colonies, was not only the greatest Temptation, but the greatest Inlet to Smuggling.

The Excise Scheme on Wines and Tobacco brought into the House March 14. — Alderman Perry and several eminent Merchants opposed the Bill — But Sir Robert Walpole persisted in his Design, and inadvertently called them *Sturdy Beggars*. Upon this the Lord Mayor of London (Sir John Barber) procured a very strong Petition against the Bill, which was followed by the chief Cities and Corporations in the Kingdom. — Sir Robert however persisted in Favour of the Bill; but his Obstinacy, Pride, and self-supposed Power, had liked to have cost him his Life, in his Return from the Parliament-House, — nothing but a kind Providence, through the Courage and Conduct of one Mr. Cunningham, could have preserved him from a desperate and incensed Mob. — However, a Promise being

[94] THE YOUNG MAN'S

given that the Bill should be dropp'd, he drove on quietly.— But they shewed their Resentment in burning him in Effigy, in several Places in and about *London*, which was followed by the chief Towns in *England*.

This year a War broke out in *Europe*, and it was so ill managed by the Conduct of this Minister, that we were obliged to desire Mr. *Keene*, then Resident in *Spain*, to use all his Efforts to prevent it. But Count de *Montijo* being then in *England*, made use of every Thing to satisfy the Ambition of the Queen of *Spain*, in demanding Satisfaction for Insults and Infractions against her Son *Don Carlos*.

1734.

*Stanislaus* was obliged to fly secretly from *Dantzic*, and leave the Crown of *Poland* to *Augustus* Elector of *Saxony*.—*Don Carlos* took Possession of *Naples*.

1735.

This Year there were sixteen *Scotch* Peers elected, which made the Public very uneasy.

The Emperor surprized at the pacific Measures of his *Britannic* Majesty.—*Don Carlos* crowned King of *Sicily*.

1736.

Sir *Joseph Jekyll*, a great Enemy to the Abuse of Gin-drinking, got a Bill passed for suppressing that notorious Vice of drinking spirituous Liquors.

The *Quakers* brought in a Bill in order to relieve them from paying Tithes, but did not succeed.

The *Dissenters* also made a Motion to have the Test Act repealed, but it miscarried.

1737.

A very great Uproar happened at *Edinburgh*, on account of executing one *Wilson*, a famous Smuggler; at last *Porteous* commanded the Soldiers to fire upon the Populace, and they killed a great many innocent Persons; but he was tried and found guilty; and though he was respited by the Regent Queen, and carried back to Prison, yet so raging were the Mob that they met with Disappointment in his Execution, that they even broke open the Prison Doors, dragged him out and hung him upon a Dyer's Post, in spite of all Force or Authority.

This Year died that renowned Prince *Eugene*, whose Courage, Conduct, and Success in every Undertaking, is not to be paralleled in the known World.

There happened a Difference between his Majesty and the Prince of *Wales*, occasioned by the Prince desiring 100,000 *l.* a Year, instead of 50,000 *l.*

There was also another Misunderstanding between them on Account

# BOOK OF KNOWLEDGE. [95]

Account of the Prince removing his Princess from *Hampton-Court* (being then very big) to *St. James's*, at which Place she was brought to bed the very Night of the Removal.

1738.

The Princess delivered of a Prince the 24th of *May*, who was christened *George*, and is our now present most gracious Sovereign, whom God long preserve!

The *Spaniards* demand 68,000 *l.* of the South-sea Company.

1739.

The City of *London* petition the Commons against the Convention, and it was followed by most of the Towns in *England*.

An Act passed in the Month of *May* for settling 15,000 *l.* per Ann. on the Duke of *Cumberland*.

Mrs. *Stephens's* famous Recipe for the Stone was now purchased by Parliament for the Sum of 5000 *l.*

The *Spaniards* behaved with uncommon Insolence, and Orders at last were given (on *July 10*) for making Reprisals upon them.—Admiral *Haddock* (whose Hands had long been tied by the Minister's Orders) had Orders to take all *Spanish* Vessels; the first of Note was the *St. Joseph*, worth 120000 *l.*

*Micajah Perry*, Lord Mayor of *London*, and the Citizens in general, are highly offended with the Proceedings of Sir *Robert Walpole*.

This Year *Whitefield* practised Field-preaching, and his Followers were first called Methodists.

Very rich Captures were made upon the *Spaniards* in *America*, and on *November 5*, the brave Admiral *Vernon* took *Porto-Bello*.

A severe hard Frost, which began *December 24*, and lasted seven Weeks and upwards.

1740.

The King acquainted the Parliament that a Marriage was proposed between the Princess *Mary* and Prince *Frederic* of *Hesse*, Son of the Landgrave, upon which they voted 40,000 *l.* for her Portion.

*March 24*, Lord *Cathcart* and Admiral *Vernon* take *Fort Chagre*.

A grand Fleet sailed from *England* to *America*, consisting of twenty seven Ships of the Line, all under Sir *Chalenor Ogle*, but failed in the Intention, in setting out too late.

*Charles VI.* died (and was succeeded by *Charles VII.*) His Death occasioned great Changes and Alterations.

The same Year died *Frederic*, King of *Prussia*, and also the Czarina, *Anna Imanowna*.



Great Insurrections at *Newcastle*, *Wibich*, and other Places, on Account of the Dearth and Scarcity of Corn.

A large Fleet of 170 Sail, under Sir *Chalenor Ogle*, arrived at *Dominica*, and Lord *Cathcart* soon after died of a bloody Flux, which totally disconcerted every Scheme in the Expedition.

*Frederic* (the present King of *Prussia*) invaded *Silesia* with an Army of 30000 Men, in so sudden a Manner, that he alarmed all *Europe*. He made the fairest and greatest Offers to the Queen of *Hungary*, but she haughtily rejected them.

February 18, his Majesty had an Address delivered by Mr. *Sandys*, in which it was most humbly desired, that Sir *Robert Walpole* might be removed from his Presence.

His Majesty takes the Part of the Queen of *Hungary* against the King of *Prussia*, who now had full 100000 Men, and had taken *Breslaw*.

1741.

A large Fleet long sitting out and detained by contrary Winds, at last joined Admiral *Vernon* in *America*. It was commanded by Lord *Cathcart*, and consisted of 115 Sail, which contained 15000 Sailors, and 12000 Land Forces.

The Forts *Bocca Chica*, *St. Joseph*, and a large *Spanish* Man of War, taken.

General *Wentworth* (who succeeded Lord *Cathcart*) and Admiral *Vernon* fall out on several Affairs; the Admiral held him afterwards in the highest Contempt, and by this Misunderstanding, and their running counter to each other, the Attempt on *Carthagena* met with no Success. Colonel *Grant* and 600 *English* lost their Lives at Fort *Lazar* to no Purpose; a Sicknel among the Troops, which carried off 3000 in two Days.

July 18, Admiral *Vernon*, with 4000 Troops, arrived at *Wattenbam* Harbour in *Cuba*, and would have attacked *St. Jago*, but was opposed by General *Wentworth*; they therefore reim-barked the 20th of *November*, and returned to *Jamaica*, having in this fatal Expedition, and by opposing each other, lost very near 20000 Men.

The elector of *Bavaria* chose Emperor at *Francfort*.

Prince *Frederic* declared that Sir *Robert Walpole* was so great a Bar between his Majesty and his Subjects, that he could not be reconciled till he was removed. Sir *Robert* (February 11) resigned all his Places, and after his Majesty had created him Baron of *Houghton*, Viscount *Walpole*, and Earl of *Orford*, he retired to *Houghton-Hall*. The People in general cried out, that the Nation was betrayed, and Sir *Robert* kreen'd.

1742.

January 20, the Merchants, in a very great Cavalcade, went to the House of Commons, and delivered a Petition, sitting forth

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forth the Losses they had sustained by *Spanish* Depredations, for the want of proper and careful Convoys. The City of *London*, *Bristol*, &c. did the same.

Mr. *Paxton*, Solicitor of the Treasury, committed to *Newgate*, for giving 500 *l.* to carry on his Election at *Wendover*; and it also appeared, that he had received in the last ten Years 95000 *l.* as Solicitor for bad Purposes.

Mr. *Scrope*, Secretary to the Treasury, was examined in his Conduct for ten Years past, and they found 1,520,000 *l.* deficient; but he told them Sir *Robert* desired him to keep it as a great Secret, and therefore refused any further Answer, which caused great Disturbances. — There was brought in an Indemnification Bill to all such who would make Discoveries of any Monies being converted to a wrong Use, or secreted; but it was thrown out by the House of Lords as unjust, so no Discoveries were made.

Admiral *Haddock* resigns his Command of the Fleet to *Lestock*, because he was not permitted to serve his Country as he would, and could have done. Admiral *Matthews* was sent to join *Lestock*; but he had an Aversion to *Lestock*, as Admiral *Vernon* had to *Wentworth*, so whatever they went about never met with its due Success.

1743.

The Broad-bottom Scheme proposed to take into the House all Sorts of Gentlemen.

*Egra* blocked up, and Prince *Charles* at the Head of the *Austrian* Army, defeated the *Bavarians* at *Brannaw*, and killed and took together 5000 Men.

Cardinal *Fleury* died February 18, aged 89.

The King commands an Army of 37000 Men at *Dettingen*, assisted by the Duke of *Cumberland*, and there in Person fought a remarkable Battle against 58000, commanded by Marshal *Noailles*; the *English* and *Hanoverians* lost about 2500, and the *French* 6000, and were obliged to retreat.

The Princess of *Wales* was happily delivered of a Son, November 14, named *William-Henry*.

1744.

The *French* and *Spaniards* propose an Invasion upon *Great Britain*, Cardinal *Tencin* promotes it, and Marshal *Bellisle* and Count *Saxe* were to execute the Scheme; accordingly, a large Number of Transports were sent to *Dunkirk* to take in 15,000 Men, and they were covered by a Fleet of Ships, under the Command of Monsieur *Roqueseuille* and *Barrail*, who had on board with them the young Pretender, being then twenty-three Years of Age. Sir *John Norris*, with a superior Fleet, came up to him, and yet never offered him Battle: However, Heaven fa-

\* I 3

voured

voured us, for a Storm drove the whole ashore. The Pretender, some Days after, arrived safe at *Calais*.

The *French* proclaim War against *Great Britain*, March 20.

Mr. *Thomson*, then at *France*, was sent to desire that the Pretender might quit the *French* Dominions; but he was ordered to leave the Court and return Home without any Answer.

War declared against *France* April 3.

The *French* and *Spanish* Fleets were shut up in *Toulon* by *Matthews*, but they came out to engage the *English*; *Matthews* bore down upon them; and his brave Followers Admiral *Rowley*, Captain *Cornewall*, and Captain *Hawke* (now Admiral) fought most bravely; but *L—st—k*, instead of engaging, was five Miles a-head; and it is not only believed but affirmed, that had he joined and assisted, they would have taken or sunk the whole, which would undoubtedly have put an end to the War. — Such is the Effect of Obstinacy, — such is the Success where there is a Want of Harmony! However, what was stranger than all this was; that they were both tried by a Court Martial, and *L—st—k* was acquitted, and *Matthews* rendered incapable of serving in the royal Navy, to the very great Astonishment of the Public. The Commons order a grand Monument to be erected in *Westminster Abbey*, in Honour to the brave Captain *Cornewall*, who was killed in the *Marlborough*, and bore the Heat and Fury of several Ships in the aforesaid Engagement.

The *French* King arrives in *Flanders* at the Head of 120000 Men.

The King of *Prussia* with 90000 is drove out of *Bohemia* by Prince *Charles* of *Lorraine*, with only 60000 Men.

The *French* beat the *Sardinians* at *Coni*.

Commodore *Anson* returned from his Voyage round the World.

This Year died that excellent Poet Mr. *Pope*.

1745.

Marshal *Bellisle*, and his Brother, seized at *Elbingrode*, and sent to *England*.

Sir *Robert Walpole* died.

The Battle of *Fontenoy*; the *French* King and the *Dauphin* in Person, and also the Duke of *Cumberland*; the *Dutch* behave most scandalously; the Duke was left between two Fires, besides a concealed Battery; but behaved with intrepid Courage and Bravery, and drove the *French* from the Field; but, however, Victory declared for the *French*, and full 7000 *British* Troops lost their Lives, and the *French*, it is said, lost more.

The *French*, after this, took *Tournay*, *Ghent*, *Bruges*, *Oudenarde*, *Dendemond*, *Ostend*, *Newport*, and several other Places, and the *French* King returned to *Paris*; but notwithstanding,

The

The Pretender, with seventeen of his Friends, embarked from Port Lazare in *Britanny*, joined by the *Elizabeth* of 64 Guns, but was met by Admiral Brett in the *Lion* of 58, who obliged Monsieur to sheer off; however, *Charles* landed at *Sky*, one of the western Islands of *Scotland*.

September 3. the young Pretender proclaimed his Father at *Dunkeld* near *Perth*, entered the City, and was joined by 3000 Troops.

They take *Edinburgh*, and he is proclaimed there.

September 21, was the Battle of *Prestonpans*, under Sir *John Cope*; the Dragoons ran away, and the Foot were routed; the brave Colonel *Gardiner* was killed, with 400 Troops, and 1200 taken Prisoners, with the Artillery, Baggage, and 6000 *l. Specie*.

The Rebels take *Carlisle*; and Admiral *Vernon*, who diligently watched the Channel, took a *French Ship*, in which was *Charles Ratcliffe* and others.

The Duke of *Cumberland* marched with 16000 Men to *Litchfield*, and now the Rebels flee Northward, but the Duke pursued them swiftly to *Clifton*.

Now that arch Fox, old Lord *Lowat*, assisted in the Rebellion.

1746.

*John Drummond* arrived with 700 Men in the *French King's* Pay, they march to *Falkirk*, where was a Battle, and 400 of the King's Troops were cut to Pieces, among whom was Sir *Robert Monro*; they also took seven Pieces of Colours, all the Tents, Baggage, &c. which caused great Consternation to all the Inhabitants of *England*, but particularly at *London*.

The Duke of *Cumberland* set out at One in the Morning, the 25th of *January*, and though a very severe Frost, arrived (with Lords *Cathcart*, *Bury*, &c.) on the 30th of *January*. The main Body of the Rebels were at *Inverness*; and the Duke was resolved to pursue them with his whole Army; accordingly, on the 8th of *April*, he passed the *Spey*. The Rebels were now at *Culloden*; and the 16th of *April* the Duke marched from *Nairn* to *Culloden*, where he attacked and defeated them, killed above 2000, with the Loss of about 300. The Earl of *Kilmarnock*, with several Persons of Note, were taken Prisoners; after this, Earl of *Cromartie*, Lord *Balmerino*, Marquis of *Tulibardine*. *Kilmarnock*, *Cromartie*, and *Balmerino*, suffered upon *Tower-Hill* August 18th. A great many more Rebels were executed in various Places, and Lord *Lowat* after this was beheaded on *Tower-Hill*.

30000 *l.* was offered for apprehending the Young Pretender; and though he could have been easily taken, yet this great Sum could not tempt the very poorest of them to betray him. He past several



several Days without Sleep or Sustenance; and though constant Search was made, yet by changing his Dress, and several other Stratagems, he went in an open Boat to *Long Isle* in a terrible Storm, and was forced to eat the salt Fish which he found upon the Rocks at *Carodan*; thus he wandered from Place to Place, almost naked, and ready to perish with Cold and Hunger, till the 19th of *September*, when he arrived at *Lochnanagh* in *Moidart*, where the *Bellona* of *Nantz* took him, and landed him at *Roscou* near *Morlaix*.

1747.

Admiral *Vernon* resigned.

*William Henry Frizo* chosen Stadtholder.

The Battle of *Val*; the Allies lost about 6000, and the *French* 11,000; Sir *John Ligonier*, in saving the Duke of *Cumberland*, was taken Prisoner.

Admiral *Anson* and Admiral *Warren* being off *Cape Finisterre*, took several *French* Men of War, which was so great a Blow to the *French*, that it totally destroyed their Scheme: Upon this *Anson* was made a Lord, and *Warren* Knight of the Bath.

In *June* the *British* Squadron took 46 Ships out of 170, which were returning from *St. Domingo*.

Admiral *Howke* with 14 Men of War intercepted 250 Sail of *French* Merchantmen going to *America*; and after a long and obstinate Sea-Fight off *Cape Finisterre*, he took six *French* Men of War, *October* 14.

*Charles Radcliffe* (who escaped in the Rebellion 1715) was beheaded on *Tower-Hill*, *December* 8.

This Year there was a very bad Distemper which raged among the horned Cattle.

1748.

*February* 19. Proclamation issued, strictly forbidding all Manner of Traffic with *France*, which drove them to great Distress, and almost to Famine.

A Congress held at *Aix la Chapelle*, *March* 11.

Preliminaries of 24 Articles are drawn up, and Peace strongly talked of.

*May*, a Proclamation for a Cessation of Arms published at *London*.

General Peace signed, *October* 6.

1749.

A Bill passed the House for erecting a Fish-market in *Westminster*.

*April* 27, the magnificent Fire-works on Account of the Peace.

The young Pretender was ordered to quit *Paris*; but not complying with Order and Authority, is seized by a Body of the *French* King's Guards, who tied him with a Cord like a Criminal,

nal, carried him to *Vincennes*, and afterwards out of the Kingdom.—So remarkable is *French* Friendship, without Gain to themselves.

The Prince of *Wales* gains great Applause; not only in encouraging all our Manufactures, but in forbidding any of his Domestics to wear any Thing of the Productions of *France*.

1750.

The *British* Herring Fishery Act passed; the Prince of *Wales* was chosen Governor, *Slingsby Bethel*, Esq; President, and *Stephen Theodore Janssen*, Vice-president, and a Capital was raised for that Purpose of 300000 *l*. There were thirty Gentlemen chosen besides to conduct Affairs in their Rotation.

A great Riot at the Election of Lord *Trentham* and Sir *George Vandeput*, Members for *Westminster*; and *Pen Léz*, only a Spectator in the Riot, was seized upon as a Rioter, and afterwards executed.

A very sensible Earthquake at *London*, and in many other Places, in *February* 8; and also another on the 8th of *March*, which terrified the whole Nation. And many Thousands (some of the superior Sort) were so sensible of the Nature and Danger, that they very wittily [foolishly] left their Habitations, and ran into the Park for Safety, at least for fear their Houses should fall upon their Heads.

An infectious Distemper broke out in *Newgate*, and at the Trials at the *Old Bailey*; the Lord Mayor and several other Magistrates and Gentlemen lost their Lives by the Taint.

Prince *Frederic William* born *May* 13.

1751.

The Nation in general (but particularly the Home Manufacturers and Artificers in and about *London*) received a great Loss in the Death of *Frederic* Prince of *Wales*, who died *March* 20. He made it his Practice to study the Affairs of Trade and Commerce; was a great Encourager of all Ingenuity, and a bountiful Patron to every liberal Art and Science. Nothing can compensate for his great Loss but the Hopes of the same Examples and Practice in his illustrious Son and Successor!

The Princess Dowager made Regent in case of the King's Demise till the Prince of *Wales's* Son, *George*, arrived to the Age of Eighteen.

A useful Act passed (by Means of the Earl of *Marblesfield*) for abolishing the Old Style in *England*, and also the Date of the Year to take Place in *January* with the Almanacks. There was eleven Days taken out of the Month of *September*, so that it contained this Year but nineteen Days; and there was no *January*

nuary nor February of 1751, for January 1751 was now dated January 1752.

The Prince of Orange died October 11, aged 41; and on the 19th of December the most excellent and beloved *Louiza*, Queen of Denmark, and youngest Daughter of his *Britannic Majesty*.

1752.

Date and Calendar altered and united.

Died Lord Viscount *Bolingbroke*.

His Majesty went to *Hanover* March 30, and arrived there April 10, and returned to *England* November 18th.

Captain *Lancey* executed for insuring a Ship for much more than its Value, and then sinking her.

*J. Benson*, Esq; and Member of Parliament for *Barnstable*, concerned with Captain *Lancey*, fled his Country for Safety.

1753.

An Act passed to purchase by Way of Lottery the curious Collection of Curiosities of Sir *Hans Sloan* (called the *Museum*) and for placing them in a proper Place; accordingly, they were, with the *Cottonian Library*, placed in *Montague House*, and allowed the most curious and magnificent of any in the known World.

*Dr. Cameron*, Brother to the famous Rebel *Lochiel*, executed at *Tyburn*, June 7.

Great Risings at *Bristol*, *Leeds*, *Manchester*, &c. on Account of the Exportation of Corn and its excessive high Price.

The Act which had passed for the Naturalization of the *Jews*, and raised the Fury of the common People, was now repealed.

The *French* commit Hostilities on the River *Ohio*, and other Parts of *America*.

*Mr. Pelham* died about the Middle of *March*, being raised from a Captain of Dragoons in the Rebellion 1715, to be first Minister. His Death made great Alterations.

The *East-India Company's* Affairs were in a very bad Situation; but they were retrieved by the Bravery, Complacency, and Conduct of Captain *Clive* (now Lord *Clive*) who at first went out only as Clerk to, or Writer in the said Company's Service.

The Hereditary Prince of *Hesse-Cassel*, and Consort to Princess *Mary* of *England*, renounced the Protestant Religion and turned Papist, to the great Grief of his *Britannic Majesty*, and the Astonishment of *Europe*.

Robberies and Murder were now so common, that nothing could check them but the Method of a Police\*, first contrived

\* Police signifies the true Regulation of the Inhabitants of any Place, City or Kingdom.—See Book of the Police, by John Fielding, Esq; sold by A. Millar in the Strand.

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by *Henry Fielding*, Esq; and afterwards put in Execution by his Brother *John*, now Sir *John Fielding*.

1755.

General *Braddock* attempting to take some *French* Forts on the *Ohio*, was told of the Ambuscades, and desired to desist; but through Pride and Obstinacy, he lost his Life in advancing towards *Fort du Quesne*; Governor *Shirley* also failed in his Intentions, at or on the *Lake Ontario*; but Colonel *Monckton* afterwards drove the *French* out of all their Forts in and about the Bay of *Fundy*, and forced above 15000 *French* and *Acadians* to give up their Arms.

The *French* were almost destroyed by *English* Cruizers, there being above 300 Merchant Ships taken.

A most dreadful Earthquake happened at *Lisbon*, which laid great Part of it in Ruins, and above 10000 Persons lost their Lives, with an incredible Quantity of Money and Effects, *November* 1. Provisions of all Sorts are sent to the *Portuguese*, and some Money, to the Value of 100,000 *l*.

1756.

The *French* very secretly prepare to take *Minorca*. Admiral *Byng* in *April* was sent with ten Ships of the Line to protect this Place and *Gibraltar*; but *Gallies* with 12 Ships, 5 *Frigates*, and 16000 Men, landed at *Minorca*, and invested *Fort St. Philip*. *Byng* afterwards fell in with the *French* Squadron, but nothing was done. *Fort Philip* surrenders at last; and about the same Time, News came that the *French* had taken *Oswego*.

*August* 12, Admiral *Byng* returned to *England*, and was committed Prisoner to *Greenwich* Hospital.

*Hawke* and *Saunders* supersede *Byng*.

The *Hanoverians* and *Hessians* arrive in *England*, and Corn being very dear, it caused great Disturbances.

The King of *Prussia* gains a complete Victory at *Lowsebutts*, and took *Dresden*.

A Subscription was opened by Justice *Fielding*, by which 400 vagabond Boys were decently clothed and fitted out for his Majesty's Service.

*Jonas Hanway*, Esq; formed the Plan of the Marine Society, by which the Navy has been supplied with upwards of 5000 Men, and near as many Boys.

*William Pitt*, Esq; chosen principal Secretary of State, in the Room of *Henry Fox*, Esq;

The Duke of *Devonshire* Head of the Treasury, Earl *Temple* of the Admiralty, and Mr. *Legge* of the Exchequer.

1757.

*Damien* attempted to stab the *French* King, *Jan.* 6.



Admiral Byng shot on Board the *Monarque*, March 14.

Pitt and Legge resign their Employments, but were presented with gold Boxes and their Freedom by the City of London.

The King of Prussia defeats Count Brown near Prague, and besieged the City.

Count Daun defeats the Prussians, and the siege of Prague is raised.

Calcutta in the East Indies taken by the Nabob, and 170 Englishmen were put into a very confined Dungeon, call'd the Black-hole, many of which perished.

Mr. Pitt reinstated Secretary of State; Mr. Legge Chancellor of the Exchequer; the Duke of Newcastle first Lord of the Treasury; Lord Anson first Lord of the Admiralty, and Mr. Fox Paymaster of the Forces.

A very violent Hurricane in North America, which did great Damage to Admiral Holbourne's Squadron there.

The King of Prussia defeated Count Daun at Lissa.

Marshal Richlieu threatened to destroy Hanover, and cruelly set Fire to Zell, and many little Children perished in the Orphan-House.

Princess Caroline Elizabeth, third Daughter to his Britannic Majesty, died December 28; she was a Princess possessed with all Humanity and Complacency.

1758.

Captain Lockhart, of the *Tartar*, for his gallant Behaviour in supporting Trade, was presented by the Merchants of London with a very fine elegant Piece of Plate, and by the Merchants of Bristol with a Gold Cup.

The fine temporary Bridge which was built cross the Thames the Time London Bridge was repairing, was burnt down Apr. 11.

The British Troops under the Duke of Marlborough landed at Cancalle near St. Maloe's, and burnt about 100 Sail of Shipping.

Louisburgh besieged under Admiral Boscawen and General Amherst, and surrendered the 26th of July.

General Abercromby appeared before Ticonderago, but lost near 2000 Men, &c. Lord Howe was killed in the March; but he sent Bradstreet against Fort Frontiniac, which he took and demolished.

Commodore Howe, with the Duke of York on Board the *Essex*, proceeded with a Fleet to Cherbourg, then landed, and destroyed its Bason and Fortifications, took all their Cannon, and burnt all the Vessels in the Harbour. An Attempt was made against St. Maloe's; they landed near St. Cas, but were repulsed by the French, and several were killed, among which was Colonel Drury.

John

## BOOK OF KNOWLEDGE. [105]

*John Fielding*, Esq; formed the Plan for the *Asylum* (near *Westminster Bridge*) for orphan Girls, in *May*.

The *Magdalen-House* in *Prescot-street*, *Goodman's Fields*, under the Management of *Robert Dingley*, Esq; was open for penitent Prostitutes the *August* following.

The *Russians* besiege *Custrin*, the King of *Prussia* gives them Battle, and killed 21,000, with the Loss of 2000 only.

The King of *Portugal* wounded by *Russians*, *October 1*.

Count *Daun* surprized the *Russians* at *Hohkerchen*, killed 7000, with Prince *Francis* of *Brunswic*, and Field Marshal *Keith*.

1759.

Her Royal Highness *Anne*, Princess of *Orange*, and eldest Daughter to his *Britannic Majesty*, died *January 12th*.

Commodore *Keppel* took the Islands, Forts, and Garrisons of *Greece*.

The Island of *Guadaloupe* taken by Commodore *Moore*.

Sir *William Johnson* took Fort *Niagara*, and General *Amberst* *Ticonderago* and *Crown-Point*.

The famous Battle of *Minden* was fought *August 1*, between Prince *Ferdinand* and Marshal *Contades*; the Marshal lost 10,000 Men, the *English* behaving with unparalleled Bravery.

Admiral *Boscawen* beat *M. de la Clue*, and took and burnt four large Men of War.

*Quebec*, Capital of the *French* in *North America*, taken by Forces under general *Wolfe*, who lost his Life in the Action, and the House of Commons ordered a Monument to his Memory in *Westminster Abby*.

An Invasion from *France* was highly talked of; as also a Descent upon *Ireland*, in a Fleet commanded by *M. Conflans*; but the brave Admiral *Harwake* came up with them, and took and sunk five of them, and drove eight up the River *Vilaine*, and dispersed the rest; for this signal Service, he had the Thanks of the House of Commons, and a Settlement of 2000 *l. per Annum* on himself and Family.

1760.

Brigadier *Murray* made Governor of *Quebec*.

In *February* *M. Thurot* landed 1000 Men in *Ireland*, but was afterwards killed in an Engagement with the bold Captain *Elliot*.

Earl *Ferrers* executed at *Tyburn* for the Murder of Mr. *Johnson*, his Steward, *May 5*.

*July 3*, a dreadful Fire in his Majesty's Yard at *Portsmouth*.

*July 31*, the Hereditary Prince gained a signal Victory over the *French* at *Erxdoff*, owing in a great Measure to *Elliot's* Horse.

*August 15*, was a remarkable Battle between the King of *Prussia*

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*Prussia* and General *Landau*, near *Lignitz*, in which 7000 *Austrians* were killed and wounded; 4000 taken Prisoners, with 90 Pieces of Cannon, &c. the *Prussians* losing but about 1000 Men.

Captain *Byron*, in the *Fame*, destroyed in the Gulf of *St. Lawrence* three *French* Frigates, and twenty-two other Vessels.

September 8, the Garrison of *Montreal* surrendered themselves Prisoners to Lord *Colville* and General *Amherst*.

October 16, the Lord Mayor and City humbly addressed his Majesty, and congratulated him on the Reduction of *Canada*.

October 23, his Majesty had a particular Desire to see a Battalion of Guards pass through *Kensington* in their Way to *Portsmouth*; and presently after was seized with some Disorder, which on the 25th was very violent, and between the Hours of 7 and 8 in the Morning he was speechless, and expired soon after. Thus died one of the best and most pacific Princes that ever sat on the *English* Throne. He died in the 77th Year of his Age, after a long and glorious Reign upwards of thirty-three Years: He loved his Subjects, and was reciprocal'y beloved by them: For so great was his Tenderness towards their Lives and Well being, that it is affirmed as Truth, that he never signed a dead Warrant for the most abandoned Malefactor but with great Reluctance, and an evident shew of Pity and Compassion. In short, he was beloved by all the Princes of every Nation, and nothing can compensate so great a Loss, but the Hope and Confidence of his Grandson, *George III.* (our now most gracious Sovereign) reading in the same Tract, and ruling his People (as his noble, good, and illustrious Grandfire has done) with all godly Quietness.

T A B L E XXI.

G E O R G E III.

*George III.* proclaimed King, Sunday, October 26.

The *Prussians* beat the *Saxons* at *Paserwalek* October 27.

First Stone of the Bridge at *Blackfriars* laid by Sir *Thomas Chitty*, Knight, Lord Mayor of *London*, October 31.

The King of *Prussia* gain a complete Victory over Marshal *Daun* near *Torgau*, November 3.

His late Majesty interred in *Henry VII's* Chapel at *Westminster*, November 11.

1761.

*Buckingham* House bought for the Use of her Royal Highness the Princess Dowager of *Wales*, for 21,000 l. Jan. 8.

An Act of an additional Duty of 3 s. per Barrel on Beer consumed, Jan. 24.

Died the Right Honourable *Edward Boscawen*, Admiral of the Blue.

Captain

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Captain *Elphinston*, in the *Richmond*, took a *French Ship* upon the Coast of *Flanders* (called the *Felicité*) she was bound to *Martinico*, and was worth 30,000*l*. Captain *Donel*, the Commander, was killed, as also very near 1000 Men, Jan. 30.

Rear Admiral *Holmes* took or destroyed two *French Men of War*, and drove three more into Port *Paix* in *Hispaniola*, February 10.

A general Fast, February 13.

Died the Right Honourable Lord Viscount *Folkestone*.

Prince *Ferdinand* and the Marquis of *Granby* beat the *French* near *Hausen*, February 21.

Admiral *Howke* took and destroyed several *French Frigates*, and retook several *English Vessels* in or near *Quebec* Bay, February 28.

The Right Honourable *Arthur Onslow*, Esq; who had been Speaker in the House of Commons twenty-three Years, resigns, by Reason of Age, and receives the Thanks of the House for his Service, March 18.

Died the Right Honourable *James*, Lord *Forbes*.

Two Persons arrived at *Cologne*, and declared, that the World would be at an end in 1773; they appeared upon Examination to be other Prophets or great Scholars, for they were examined by the *Jesuits*, and far exceeded them all in the Languages of *Latin*, *Greek*, *Hebrew*, *Chaldaic*, &c. They said they were come to turn Men to Repentance, and being put into Iron, they broke them (as it is reported) easily. They said they had lived on Earth seven Hundred Years, and said as follows.

1. There will be a general War in 1765.
2. *Constantinople* destroyed, 1766.
3. The true God confessed by all Nations, 1767.
4. A great Man will give his Testimony to it, 1768.
5. *England* will be overflowed, 1769.
6. An universal Earthquake, 1770.
7. The Sun, Moon, and Stars will fall 1771.
8. The Globe of the Earth burnt, 1772.
9. The universal Judgment, 1773.

It has much amused all *Europe*, but it is supposed to be only a Juggle among the *Jesuits*.

An Earthquake happened at *Corunna*, April 18; there were no Houses fell; but several large Buildings were moved out of their Places into a different Position; among which was the Consul's House, which was carried near two Yards from the Place where it stood, and the Front turned two Points of the Compass in its Position.

Transit of the Sun over *Venus*, June 6.

*Bellisla* taken, June 7th.

July



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July 20, News arrived at *Whitehall* of *Pondicherry* surrendering to Colonel *Cooté* and Admiral *Stevens*, Jan. 15.

July 21, Commodore Sir *James Douglas* sends Word to Mr. *Cleveland* of the Surrender of *Dominique* or *Dominico*, June 8. This is a small but fertile Island, lying between *Guadaloupe* and *Martinico*.

A most dreadful Storm and Whirlwind happened at *Charles-Town* in *South Carolina* on the 4<sup>th</sup> of *May*; it was seen about two o'Clock coming down *Wampoo Creek*, and passed down *Asb-ley River* like a large Column of Vapour and Smoke, and with such Strength and Velocity that it almost emptied the River, threw up the Water to an incredible Height, and whirled round the very Clouds; and every Thing about it; sunk five Ships in an Instant, and tore and threw up the rest against each other in a shocking Manner. In short, had there not happened (as is commonly expressed) a very great Gust of Wind from *Cooper's River*, which met this Column of Air, it must have totally destroyed the whole Town instantaneously; but this broke it, and a most hideous Noise like perpetual Thunder continued for some Time. But by kind Providence the Town was preserved; the Damage amounted but to about 24,000 *l.* and only four Lives were lost in the Shipping, but it drove down many Houses in its Course; tore every tree up in its Place; killed the Cattle, and drove every Thing before it, till it was broke.

Prince *Ferdinand* gains a Victory over Prince *Soubize*, in the Neighbourhood of *Hanover*, July 16; he took nine Pieces of Cannon, six Pair of Colours, and killed and wounded near 5000 Men.

The King declares his Mind to the Council of his Intention to take a Royal Consort; and the privy Counsellors desire it may be made public; accordingly, it was publicly declared the 8<sup>th</sup> of July, that the King intended to make the Princess *Charlotte* of *Mecklenburgh Strelitz* his Royal Consort in Marriage.

The French were beat by Prince *Ferdinand* and the Marquis of *Granby*, near *Burena*, August 15.

Prince *Henry* of *Brunswic* died at *Ham*, August 13, of the Wounds he received in a Skirmish July 23.

Her Serene Highness Princess *Sophia Charlotte*, with the Earl of *Harcourt*, arrived at *Harwich*, September 8, and lay at *Witham* at Lord *Abercorns*, and the next Day proceeded to St. *James's*; and in the Evening the Solemnity of his Majesty's Marriage with her was performed in the Royal Chapel, by the Archbishop of *Canterbury*.

The King and Queen crowned in *Westminster-Abby*, September 22.

One House at the Corner of *Parliament-street* was let for 600 Guineas; and Mr. *Vaughan*, Master of the Royal Oak, new Palace-

# BOOK OF KNOWLEDGE. [109]

Palace-Yard, was offered 500 Hundred Guineas for his House, only for the Coronation Day, but refused it.

The French under the Marquis de Conflans committed unheard of Cruelties at or about Embden, raising great Contributions, cutting off Women, killing and blowing up Persons, and committing all Manner Ravages, September 22.

Sir John Cust chosen Speaker, November 6.

General Platen (one of the Prussian Commanders) was surprized by General Berg near Stargard, but was repulsed, with the Loss of 5000 Men.

The Reverend Mr. Whitefield gave to the Reverend Hegenbayn, his Majesty's German Chaplain, 300*l*. for the Service and Sustainance of the Prussian Soldiers.

1762.

War proclaimed against Spain about twelve at St. James's, and about two o'Clock at the Royal Exchange, Monday, January 4.

A general Fast.

The Empress of all the Russias, and second Daughter to Peter the Great, died February 5.

General Monckton and Admiral Rodney land at Martinico, January 20.

Fort Royal taken, Feb. 10.

Port Pierre's, or St. Peter's, taken, Feb. 27.

Martinico conquered, Feb. 28.

The Island of St. Lucia surrenders to Captain Harvey, March 1.

Granada taken, March 16, by Brigadier Walsh, without the Loss of one Man.

The first Stone of the new Jewish Synagogue, opposite Cree-Church, Leadenhall-street, was laid with great Ceremony, May 28.

Prince Ferdinand and the English beat the French under the Marshals d'Estrées and Soubize, at Grabenstein, June 24.

Peter III. Emperor of Russia, dethroned by his Empress Catherine, July 9.

The Emperor, it is believed, was murdered; but she published a curious Declaration, that he died of a bloody Flux, June 16th, though it is very evident he died in a very secret Place, for we never had any real Account given where or how he died, but by her plausible Channel.

The Queen delivered of a Prince, August 12, about seven in the Morning.

The King of Prussia beats the Austrians at or near Guttmanstorf.

The young Prince of Wales christened by the Name of George Augustus Frederic, Sept. 8.

Saturday

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Saturday 11, 5007 Ship-Letters from *Jamaica* and the *Leeward Islands* came to the general Post-Office.

The *Harvanna* taken under the Earl of *Albemarle*, Sir *George Pocock*, &c. *August* 18 and 19.

Garrison of *St. John* surrenders and capitulates to General *Amberst*, *Sept.* 20.

Battle between the *French*, *English*, and *Hanoverians*, at or near *Bruckner Muhl* in *Germany*, *Sept.* 26.

The King of *Prussia* takes *Schweidnitz*, *Oct.* 9.

Preliminary Articles of Peace between *England* and *France* signed at *Fontainebleau*, *Nov.* 3.

Convention signed at *Cassel* between Prince *Ferdinand* and the Marshals d' *Estrées* and *Soubize*, *Nov.* 16.

1763.

Duke *Nivernois* made a Fellow of the Royal Society, *January* 28.

The Right Honourable *William Beckford* Lord Mayor of *London*, made a grand Entertainment at his Mansion House to the Duke of *York*, and a great Number of the Nobility and Gentry. The Supper consisted of between three and four Hundred covered Dishes, and also a very fine Desert, *Feb.* 4.

The definitive Treaty of Peace arrives from *Paris*, signed by the Duke of *Bedford*, the Duc de *Praslin*, and the Marquis de *Grimaldi*, *Feb.* 19.

The Ratification of the Treaty passed the great Seal, *Feb.* 22.

News arrived from *Goree* dated *Nov.* 1. giving an Account that on the 15th of *October* the Magazine, containing 8500 lb. of Gun-Powder, blew up, and beat the Governor's House down, but killed but few Persons, considering the Quantity, but it set Fire to the *Negro Town*, and totally consumed it.

The Sea broke in at *Thomy* in the Island of *Ely*, made a Breach or Chasm of 100 Yards, and overflowed all the Parts there: The Damage was computed at 100,000 *l.* Many other Places also the Sea broke in upon, and at others rose to an uncommon Height, which overflowed and did unaccountable Damages, *Feb.* 20, 21, 22, &c.

There was an exact Balance made between the *French* and our Government relating to the Prisoners of War, and the Balance due to us amounted to upwards of 1,200,000 *l.* Sterling.

Peace proclaimed between *England*, *France*, and *Spain*, on Tuesday, *March* 22. We hope it will be a happy and lasting one.

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THE  
YOUNG MAN'S  
Book of Knowledge, &c.

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PART II.  
GEOGRAPHY.

DIALOGUE II. SECT. I.

TYRO. **W**HAT do you mean by Geography?

PHIL. Geography teaches the Properties of the Earth, in Respect both to Land and Water; as also the different Situation and Distance in Respect of each other.

TYRO. Into how many Parts is the Earth divided?

PHIL. Into many, but all are contained under four Heads, called Quarters.

TYRO. What are the Names of these four Quarters?

PHIL. They are call'd, 1. *Europe*, 2. *Asia*, 3. *Africa*, and 4. *America*.

TYRO. What are the other nominal Parts of the Earth; or how is it yet further divided in Relation to Land and Water?

PHIL. Into ten different Names; five belonging to the Division of Land; viz. 1. A Continent. 2. An Island. 3. A Promontory or Cape. 4. A Peninsula. And 5. An Isthmus. And these answer to the next five belonging to the Water; viz. 1. An Ocean. 2. A Lake. 3. A Bay. 4. A Gulph. And 5. A Streight. These answer to each other (as was said before) as more plainly appears by the following Description.

LAND.



## LAND.

1. A Continent is a large Tract, or vast Extent of main Land, not separated by any Ocean. Thus *Europe, Asia, Africa, &c.* are Continents.

2. An Island is a Tract of Land surrounded with Water: as *Great Britain, Ireland, Madagascar, &c.*

3. A Promontory, or Cape, is a Portion or Part of Land running far into the Sea; as *Cape Verde, Cape of Good Hope, &c.*

4. A Peninsula is a Part or Portion of the Earth almost surrounded with Water, save only a narrow Part or Neck of Land which ties or unites it to a Continent: as *Africa* itself, *Jutland, &c. &c.*

5. An Isthmus is a narrow Part of Land, by which a Peninsula is joined to a Continent, or Main-Land; as the Isthmus of *Panama*, which joins *North* and *South America* together; the Isthmus of *Corinth, &c. &c.*

## WATER.

1. An Ocean (or Sea) is a large Extent or Collection of Waters, free from Land; such as the *Atlantic* or *Western Ocean*, the *Indian Ocean, &c.*

2. A Lake is a Tract of Water surrounded by Land: as the Lake of *Geneva*, the *Dead Sea*, the *Caspian Sea, &c.*

3. A Bay is a Portion or Part of the Sea running far up the Main-Land; as the *Bay of Biscay, Bay of Siam, &c.*

4. A Gulph (or inland Sea) is a Part of the Ocean almost surrounded with Land, save some Streight or narrow Gut of Water, by which it has Communication with the Ocean; as the *Gulph of Arabia*, the *Mediterranean Sea, &c.*

5. A Streight is a narrow Passage or Part of the Sea, which joins one Sea to another; as the *Streights of Gibraltar*, which joins the *Mediterranean Sea* to the *Atlantick Ocean*; the *Streights of Babelmandel, &c.*

## S E C T. II.

*A further Description of the four Quarters of the World; and,*

## I. Of EUROPE.

TYRO. What are the Principal Kingdoms or Parts into which *Europe* is divided?

PHILO. They are nine in Number, viz. 1. *Scandinavia*, (which contains *Sweden*, or *Swedeland*, *Denmark*, and *Norway*.) 2. *Moscovia*, or *Russia*. 3. *France*. 4. *Germany*. 5. *Poland*. 6. *Spain*. 7. *Italy*. 8. *Portugal*. And 9. *Turkey*.

## I. Of SCANDINAVIA.

TYRO. What do you mean by *Scandinavia*, and how, or whereabouts is it situate?

PHILO.

PHILO. *Scandinavia* is a large Continent, situate between fifty-four and seventy-two Degrees of N. Latitude; under which Name is comprehended the Kingdoms of *Sweden*, *Denmark*, and *Norway*, as was said before.

I. SWEDEN.

TYRO. How is *Sweden* situate?

PHILO. *Sweden* is bounded on the N. and E. by *Norway*, on the E. by *Moscovia*, and on the S. by the *Sound*, and Part of the *Baltick*. Its Metropolis or Chief Town is *Stockholm*, whose Distance from *London* is about twelve Degrees three fourths, viz. eight hundred eighty-six Miles N. E. The longest Day in the most northern Parts of this Country is about two Months, and the shortest in the most southern Parts about six Hours and Half.

2. DENMARK.

TYRO. How is *Denmark* situate?

PHILO. *Denmark* is bounded on the N. by the *Sound*, on the E. by the *Baltick*, on the S. by Part of *Germany*, and on the W. by the *German Ocean*. Its Metropolis is *Copenhagen*, whose Distance from *London* is about six hundred and ten Miles N. E. The Length of the longest Day, in the most northern Parts of this Country, is about seventeen Hours and Half long, and the shortest in the most southern about eight Hours and Half long.

3. NORWAY.

TYRO. How is *Norway* situate?

PHILO. *Norway* is situate on the N. W. and S. by Part of the *Main Ocean*, and on the E. by *Sweden* and the *Gulph of Bothni*. Its Metropolis is *Bergen*, whose Distance from *London* is about nine Degrees one fourth; viz. six hundred forty-two Miles N. by E. The Length of the longest Day in the most northern Parts is above two Months, and the shortest in the most southern about six Hours and Half.

II. Of MOSCOVIA or RUSSIA.

TYRO. How is *Moscovia* situate?

PHILO. *Moscovia* is bounded on the N. by the great *Northern Ocean*, on the E. by *Tartary*, on the W. by *Sweden*, and on the S. by the *Caspian Sea*, and Part of *Little Tartary* and *Georgia*. Its Length is computed to be about one thousand two hundred and fifty Miles, and Breadth about one thousand one hundred Miles. Its chief Province is *Moscowy*, and its Metropolis *Moscow*, whose Distance from *London* is about twenty-three Degrees, viz. is nearly sixteen hundred Miles N. E. and about eight hundred E. of *Cracow*. The longest Day in the most

most northern Part of this Country is about two Months, and the shortest in the most southern is about nine Hours and Half.

### III. Of FRANCE.

TYRO. How is *France* situate ?

PHILO. *France* (called *Gallia*, or Place of the antient *Gauls*) is bounded on the N. by the *English Channel*, on the E. by *Germany*, on the S. by Part of *Spain* and the *Mediterranean Sea*, and on the W. by the *Bay of Biscay*. Its Length is computed to be five hundred and fifty Miles, and the Breadth three hundred and eighty. Its Metropolis is *Paris*, whose Distance from *London* is about three Degrees S. S. E. viz. two hundred and ten Miles. The Length of the longest Day in the most southern Part of this Kingdom is about sixteen Hours one Quarter, and the shortest in the most southern Part nine Hours one Quarter.

### IV. Of GERMANY.

TYRO. How is *Germany* divided ?

PHILO. *Germany* is in Length about five hundred and fifty Miles, and Breadth about five hundred and ten. It is divided into three Parts, viz. *Holland*, *Flanders*, and *Upper Germany*.

#### I. HOLLAND.

TYRO. How is *Holland* situate ?

PHILO. *Holland* is bounded on the N. by Part of the *German Ocean*, on the E. by *Upper Germany*, on the S. by *Flanders*, on the W. and Part of the N. by the *German Ocean*. Its Metropolis (on the N. Part) is *Amsterdam*, whose Distance is about two hundred and ten Miles E. of *London*; and *Rotterdam* on the S. which is about one hundred and ninety Miles S. E. of *London*.

#### 2. FLANDERS, or SPANISH NETHERLANDS.

TYRO. How is *Flanders* situate ?

PHILO. *Flanders* is bounded on the N. by *Holland*, on the E. by *Upper Germany*, on the S. by *France*, and on the W. by the *German Ocean*. It has many fair and rich Provinces, the Metropolis of which is *Antwerp*, whose Distance from *London* is about one hundred and eighty-five Miles E.

#### 3. UPPER GERMANY.

TYRO. What do you mean by *Upper Germany*, and how is it situate ?

PHILO. *Upper Germany* is Part of *Germany* itself, and Part of *Gallia* and *Old Italy*. It is bounded on the N. by *Denmark* and Part of the *Baltick*, on the E. by *Poland*, on the S. by *Italy*, and on the W. by *France*. Its Metropolis is *Cologne*,  
 8 whole

whose Distance from *London* is about three hundred and forty Miles E.

## V. Of POLAND.

TYRO. How is *Poland* situate?

PHILO. *Poland* is bounded on the N. by Part of *Moscovia* and Part of the *Baltick*, on the E. by *Little Tartary* and Part of *Moscovia*, on the S. by *Hungary*, *Transilvania* and *Moldavia* in *Germany*, and on the W. by *Upper Germany*. Its Length is about six hundred Miles, and Breadth about five hundred and ninety. Its Metropolis is *Cracow*, whose Distance is from *London* thirteen Degrees one Half, viz. about nine hundred and forty Miles E. The longest Day in the most northern Part of this Country is about seventeen Hours and Half, and the shortest in the most southern about eight Hours one Quarter.

TYRO. Is there any other remarkable Places belonging to *Poland*?

PHILO. Yes, *Prussia*, whose chief Town is *Dantzick*; and *Little Russia*, whose chief Town is *Lemburg*.

## VI. Of SPAIN.

TYRO. How is *Spain* situate?

PHILO. *Spain* is bounded on the N. by Part of *France* and the *Bay of Biscay*, on the E. by the *Mediterranean*, on the S. by the *Streights of Gibraltar*, and on the W. by *Portugal*. Its Metropolis is *Madrid*, whose Distance is better than eleven Degrees, viz. about seven hundred and eighty Miles S. by W. of *London*. The longest Day in the most northern Parts of this Kingdom is about fifteen Hours one Quarter, and the shortest in the most southern Part is about nine Hours one Quarter.

## VII. Of PORTUGAL.

TYRO. How is *Portugal* situate?

PHILO. *Portugal* is bounded on the N. by Part of the *Bay of Biscay*, on the E. by *Spain*, and S. and W. by the *Atlantic Ocean*. Its Metropolis is *Lisbon*, whose Distance from *London* is better than fourteen Degrees S. W. by S. viz. about nine hundred and eighty Miles. The longest Day in the most northern Parts of this Country is about fifteen Hours, and the shortest in the most southern about nine Hours three Quarters.

## VIII. Of ITALY.

TYRO. How is *Italy* situate?

PHILO. *Italy* is bounded on the N. by Part of *Germany*, on the N. E. by the *Adriatic Sea*, or *Gulph of Venice*, and on the S. and W. by the *Mediterranean* and Part of *France*. Its Me-



tropolis is the City of *Rome*, (the Seat of Papacy, and Residence of the Pope, the pretended Successor of *St. Peter*, and infallible Head of the Church in all spiritual Matters and Controversies, as appears by the Articles of their Faith \*) whose Distance from *London* is nearly thirteen Degrees S. E. viz. about nine hundred and three Miles.

☞ Here follows a brief Account of the popish Creed, or Articles of Faith, commonly called Pope *Pius IVth's* Creed.

*Note.* This Creed is divided into twenty-four Articles; the first twelve of which, being the very same as our *Nicene Creed*, I omit, and begin with their thirteenth Article.

Art. 13. ' I most firmly admit and embrace the apostolical  
' and ecclesiastical Traditions, and all other Observations and  
' Constitutions in the Church of *Rome*.

Art. 14. ' I do admit the Holy Scriptures in the same Sense  
' that holy Mother-Church doth, whose Business it is to judge  
' of the true Sense and Interpretation of them; and I will in-  
' terpret and receive them according to the unanimous Consent  
' of the Fathers.

☞ Art. 15. ' I do profess and believe that there are seven  
' Sacraments of the *New Testament*, truly and properly so  
' called, instituted by *Jesus Christ* our Lord, and necessary for  
' the Salvation of Mankind; tho' not all of them to every one;  
' viz. Baptism, Confirmation, the Eucharist, Penance, Ex-  
' treme Unction, Orders, and Marriage: and that they do  
' confer Grace; and that of these, Baptism, Confirmation and  
' Orders, may not be repealed without Sacrilege: I do also  
' receive and admit the received and approved Rights of the  
' Catholic Church, in her solemn Administration of the said  
' Sacraments.

Art. 16. ' I do embrace and receive all and every Thing  
' that hath been defined and declared by the holy Council of  
' *Trent*, concerning Original Sin and Justification.

☞ N. B. Art. 17. ' I do also profess that in the Mass there  
' is offered unto God a true, proper, and propitiatory Sacrifice  
' for the Quick and the Dead; and that in the most holy Sa-  
' crament of the Eucharist there is truly, really, and substan-  
' tially, the Body and Blood, together with the Soul and Di-

\* As I am sensible the Emissaries of *Rome* are never wanting, by Artifice and Cunning, to gain many Profelytes to their Persuasion (and especially from the established Church) I think this Digression will not be taken amiss by true Lovers of Protestantism and Liberty; and as it may happen, that this small Tract may fall into such Hands as have not yet heard of their Errors and Inconsistencies; if but one out of those many by this Means be prevented from falling a Sacrifice to their pernicious Principles, it will both answer my Design and their Welfare.

'vinity of our Lord *Jesus Christ*; and that there is a Conversion made of the whole Substance of the Bread into the Body, and of the whole Substance of Wine into the Blood; which Conversion the Catholic Church calls Transubstantiation \*.'

Art. 18. 'I confess under one kind only, whole and entire, *Christ* and a true Sacrament is † taken and received.'

Art. 19. 'I do firmly believe that there is a Purgatory, and that the Souls kept Prisoners there do receive help by the Suffrages (or Prayers) of the Faithful.'

☞ Art. 20. 'I do likewise believe that the Saints reigning together with *Christ* are to be worshipped and prayed unto; and they do offer Prayers unto God for us; and that their Relicks are to be had in Veneration.'

Art. 21. 'I do most firmly assert that the Images of *Christ*, of the Blessed Virgin, the Mother of God, and of the other Saints, ought to be had and retained, and that due Honour and Veneration ought to be given them.'

Art. 22. 'I do affirm that the Power of Indulgencies was left by *Christ* in the Church, and that the Use of them is very beneficial to christian People.'

Art. 23. 'I do acknowledge the Holy Catholic Roman Church to be the Mother and Mistress of all Churches; and I do promise and swear true Obedience to the Bishop of Rome, the Successor of St. *Peter*, the Prince of the Apostles, and Vicar of *Jesus Christ*.'

Art. 24. 'I do undoubtedly receive and profess all other Things which have been delivered, defined, and declared by the sacred Canons and oecumenical Councils, and especially by the holy Synod of *Trent*; and all other Things contrary thereunto, and all Heresies condemned, rejected, and anathematized by the Church, I do likewise condemn, reject, and anathematize.'

Consider, *Tyro*, whether these Impositions are consistent with Christian Liberty.

\* This Article is not only blasphemous, but even ridiculous beyond Measure, since every one knows that Matter, (*viz.* any Substance) cannot be in two or more Places at one and the same Time: therefore let us charitably conclude, that the more learned sort of Persons cannot possibly believe this Article, though they are bound to give their Assent to it.

† It is well worthy our Notice to observe, the Verb *is*, in this Article is not good Grammar: For *Christ* and the Sacrament being two distinct Things, the Verb should be *are*. But to reconcile this with the foregoing Article, they have put the Verb *is*, to shew that the real Body and Blood of *Christ*, and the Eucharist, are one and the same. This is a cunning, yet wicked and ignorant Inconsistency.

## IX. Of TURKEY in Europe.

*Tyro.* How is Turkey situate?

*Philo.* Turkey is bounded on the N. Part by *Poland*, on the E. by the *Black Sea*, and Part of *Turkey in Asia*, on the S. by Part of the *Ionian Sea*, and on the W. by the *Gulf of Venice*, and Part of *Germany*. It lies between thirty-six and forty-nine Degrees N. Latitude. Its Metropolis is *Constantinople*, whose Distance from *London* is twenty-three Degrees three fourths; viz. about one thousand six hundred and fifty Miles E. by S.

The Length of this Country is about six hundred and sixty Miles, and its Breadth about the same. The longest Day in the most northern Part is about sixteen Hours, and the shortest in the most southern about nine Hours three Quarters.

*The Division of TURKEY.*

*Tyro.* Is not Turkey divided into different Parts or Classes.

*Philo.* Yes, into many, but chiefly into four; viz. 1. *Hungary*. 2. *Greece*. 3. *Little Tartary*, called by some *Crim Tartary*, from a large Town. 4. The *Danubian Provinces*.

1. HUNGARY.

*Hungary*, tho' now chiefly under the Emperor of *Germany*, is notwithstanding a Part of *Turkey*. It is bounded on the N. by Part of *Poland*, on the E. by *Transilvania*, on the S. by *Sclavonia*, and on the W. by *Austria*. Its chief City is *Buda*, whose Distance from *London* is better than twelve Degrees and a half; viz. about eight hundred and forty Miles S. E.

2. GREECE.

*Tyro.* How is *Greece* situate?

*Philo.* *Greece* is bounded on the N. by the *Danubian Provinces*, on the E. by the *Ægean Sea*, called *Archipelago*, on the S. and W. by the *Mediterranean*. Its chief Cities are *Athens* (or *Settines*) and *Andrinople*; the first of which is about four hundred and twenty Miles S. W. of *Constantinople*, and the other about one hundred and forty-six N. W. of the same. *Corinth* is about fifty-four Miles W. of *Athens*, and *Thebes*, or *Stives*, is about forty-five N. W. of *Athens*.

3. LITTLE TARTARY.

*Tyro.* How is *Little Tartary* situate?

*Philo.* *Little Tartary* is bounded on the N. by Part of *Moscovia*, on the E. by *Georgia*, on the S. by the *Black Sea*, and on the W. by *Podolia*.

Its

Its Metropolis is *Kaffa*, subject to the *Turks*; it stands near the *Euxine Sea*, about three hundred and eighty Miles N. E. of *Constantinople*, and about five hundred Miles S. of *Moscow*.

4. Of the DANUBIAN Provinces.

TYRO. What do you mean by the *Danubian Provinces*; and how are they situate?

PHILO. They are so called, because they chiefly stand upon, or near the *Danube*, which extends itself from *Kilia*, near the *Black Sea*, to *Vienna* in *Germany*.

TYRO. How many Provinces are there?

PHILO. Nine; 1. *Transilvania*. 2. *Valachia*. 3. *Moldavia*. 4. *Romania*. 5. *Bulgaria*. 6. *Servia*. 7. *Bosnea*. 8. *Sclavonia*. 9. *Croatia*.

S E C T. III.

Of the EUROPEAN Islands; and,

I. Of ENGLAND.

TYRO. How is *England* situate?

PHILO. *England* (call'd also *Anglia*, *Britannia*, or *Albion*) is bounded on the N. by *Scotland*, on the E. by the *German Ocean*, on the S. by its own Channel, which parts it from *France*, and on the W. by *St. George's*, or the *Irish Sea*: It lies between fifty and fifty-six Degrees N. Latitude: Its Length is about three hundred and twenty, and Breadth about two hundred and ninety Miles: Its Metropolis is *London*, whose Latitude is about fifty-two Degrees and thirty Minutes.

This Island contains thirty-eight Counties (besides *Middlesex* and *Cheshire*): It has two Universities, *Cambridge* and *Oxford*, and twenty-four Bishopricks.

TYRO. Are these all the Counties in *England*?

PHILO. Yes, exclusive of *Wales*, which has four Circuits, twelve Counties, and four Bishopricks. The longest Day in the most northern Part is about seventeen Hours and an Half, and the shortest in the most southern about eight Hours.

II. Of SCOTLAND.

TYRO. How is *Scotland* situate?

PHILO. *Scotland* (called also *Caledonia*) is bounded on the N. and W. by the *Baltick Sea*, on the E. by Part of the *German Ocean*, and on the S. by *England*. It lies between fifty-five and fifty-nine Degrees N. Latitude. Its Length is about two hundred and forty, and Breadth about one hundred and eighty Miles, and its Metropolis is *Edinburgh*, whose Distance from



*London* is nearly four Degrees and a Half; viz. about three hundred Miles almost N. The longest Day in the most northern Part of this Country is about eighteen Hours and a Half, and the shortest in the most southern six Hours and a Half.

### III. Of IRELAND.

TYRO. How is *Ireland* situate?

PHILO. *Ireland* (called by some *Britannia Parva*, and by others *Hibernia*) is surrounded by the *British Ocean*. It lies between fifty-one and fifty-five Degrees of N. Latitude. The Length is about two hundred and sixty, and Breadth about one hundred and fifty Miles. Its Metropolis is *Dublin*, which is distant from *London* nearly three Degrees and a Half; viz. about two hundred and forty Miles N. W. The Length of the longest Day in the most northern Part is about seventeen Hours and a Half, and the Length of the shortest in the most southern about seven Hours three Quarters.

### S E C T. IV.

I. Of the lesser European Islands, and first of such as lie near Great Britain.

1. Those on the North are,

1. The Orkneys, or Orcades. 2. Shetland.

2. Those on the East are,

1. Holy Land. 2. Fern Island. 3. Cocket Island. 4. Sheppy Island. And 5. The Isle of Thanet.

3. Those on the South are,

1. Portland Island. 2. The Isle of Wight. 3. Portsea Island.

4. Those on the West are,

1. Lewis Island. 2. Skye. 3. Mul. 4. Jura. 5. Ila. 6. Arran. 7. Man. 8. Anglesey. And 9. Scilly.

II. Of other European Islands more distant from Great Britain.

1. The AZORES.

These Islands lie W. of England, and are subject to the King of Portugal. They are nine in Number; viz. 1. St. Michael. 2. St. Maria. 3. Tercera. 4. Gratijsa. 5. St. George's. 6. Pico. 7. Fyal. 8. Flores. And 9. Cuervo.

2. Those

2. *Those of SWEDEN.*

These are eight in Number ; viz. 1. *Rugon.* 2. *Bornholm.*  
3. *Ocland.* 4. *Gothland.* 5. *Ocsal.* 6. *Dago.* 7. *Aland.*  
8. *Ween.*

3. *Those of DENMARK.*

These are nine ; viz. 1. *Zealand.* 2. *Funen.* 3. *Langland.*  
4. *Laland.* 5. *Falster.* 6. *Mona.* 7. *Femerer.* 8. *Alsen.*  
And 9. *Iceland.*

4. *Those of NORWAY.*

These are four ; viz. 1. *Carmen.* 2. *Hifleren.* 3. *Sanien.*  
4. *Suroy.*

5. *MEDITERRANEAN Islands.*

TYRO. How many Islands go under this Name, and how are they situate ?

PHILO. There are twenty-one nominal Islands, which are situate S. of *Europe* on, or near, the *Mediterranean Sea* ; but the following are most noted ; viz. 1. *Yvica.* 2. *Minorca.* 3. *Majorca*, situate W. of *Valencia* in *Spain.* 4. *Corfica.* 5. *Sardigna*, lying S. of *Genoa.* 6. *Malta.* 7. *Sicily*, lying S. W. of *Naples.* 8. *Cyprus.* 9. *Candia.* And 10. *Rhodes*, S. of *Antolia* and *Archipelago.*

The other small Islands are of little or no Signification. Thus much for *Europe.*

DIALOGUE III. SECT. I.

Of ASIA.

TYRO. **I**N what Part of the Globe is *Asia* situate ?

PHILO. *Asia*, though called the second, yet is the principal Quarter of the Globe, lying upon the E. Part thereof, and extends itself from ten Degrees S. Latitude, to seventy-six N. Latitude, and is divided into five principal Parts ; viz. 1. *Tartary.* 2. *China.* 3. *India.* 4. *Persia.* And 5. *Turkey.*

1. Of TARTARY.

TYRO. How is *Tartary* situate ?

PHILO. *Tartary* is bounded on the N. by the *Tartarian Ocean*, or *Frozen Sea*, on the E. by the same, and the *Main Ocean*, on the S. by *China*, *India*, and *Persia*, on the W. by *Muscovia* or *Russia.* It lies between thirty-five and seventy-six Degrees N. Latitude, and under the seven, eight, nine, ten, eleven, twelve, and thirteen N. Climates ; is about three thousand Miles long, and two thousand two hundred and fifty broad,

and its chief City is *Cambalie*. The longest Day in the most northern Part is about two Months, and the shortest in the most southern about nine Hours three Quarters. It is subject to the *Great Cham's* despotic Government.

## 2. Of CHINA.

TYRO. How is *China* situate ?

PHILO. *China* is bounded on the N. by Part of *Tartary*, on the E. by the *Chinese Ocean*, on the S. by Part of the *Indian Ocean*, on the W. it has *India* without the *Ganges*. It lies between the fourth, fifth, and sixth N. Climates, is about one thousand four hundred Miles long, and one thousand two hundred and sixty broad, and its chief City is *Pekin*, whose Distance from *London* is seventy Degrees and a Half ; viz. about four thousand nine hundred Miles E. and from *Pekin* to *Nankin* about six hundred and ninety Miles S. E. in the former of which is a Bell eleven Feet Diameter, and twelve Feet high, weighing about fifty-three Tons and a Half. The longest Day in the most northern Part is about fourteen Hours three Quarters, and the Length of the shortest in the most southern is about ten Hours three Quarters. It is under the Government of the *Great Cham*.

## 3. Of INDIA.

TYRO. How is *India* situate ?

PHILO. *India* is bounded on the N. by Part of *Tartary*, on the E. by *China*, on the S. by the Gulf and Bay of *Bengal*, and on the W. by *Persia*. It lies between nine Degrees of S. and thirty-four of N. Latitude. Its Length is computed one thousand six hundred and eighty Miles, and Breadth much the same, and lies under the third, fourth, &c. N. Climates. It is divided into three grand Parts ; viz. 1. The *Great Mogul's* Empire, containing *Delli Agra* (his imperial Seat) *Cambaia* and *Bengal*. 2. *India* within the *Ganges*, whose chief Kingdoms are *Decan*, *Golcond*, *Bisnagar*, and *Malabar*.

3. *India* without the *Ganges*, whose chief Kingdoms are *Pegu*, *Tonquin*, *Cochinchina*, and *Siam* ; this last contains *Martiban* *Siam*, and *Malucca*, subject to the King of *Pegu*. Length of Days and Nights much the same as in *China*.

## 4. Of PERSIA.

TYRO. How is *Persia* situate ?

PHILO. *Persia* is bounded on the N. by the *Caspian Sea*, on the E. by *India*, on the S. by the *Persian Gulf* and *Indian Ocean*, and on the W. by *Asiatic Turkey*. It lies between twenty-five and forty-five Degrees of N. Latitude, and under the third and fourth N. Climate. Its Length is computed about one thousand four hundred and fifty Miles, and Breadth one thousand

two hundred and fifty. It is divided into three Parts, N. Middle and S. It is governed by the despotic Power of the *Great Sophy*. They are chiefly *Mabometans*. The longest Day in the most northern Parts is about fourteen Hours three Quarters, and the shortest in the most southern about thirteen Hours one Quarter.

#### 5. Of TURKEY in ASIA.

TYRO. How is *Turkey* situate?

PHILO. *Turkey*, situate in *Asia Minor*, is bounded on the N. by the *Black Sea*, on the E. by *Persia*, on the S. by Part of *Africa* and Part of the *Indian Ocean*, on the W. by the *Red Sea*. It lies between twelve and forty-six Degrees of N. Latitude; is computed about two thousand one hundred Miles long, and one thousand seven hundred and fifty broad. It contains six great Parts; viz. 1. *Natolia*, whose chief City, or Town, is *Bursa*. 2. *Arabia*, whose Metropolis is *Midina*. 3. *Syria*, whose Capital is *Aleppo*. 4. *Diarbeck*, whose chief City is *Bagdat*. 5. *Turcomania*, whose Capital is *Arzerum*. And 6. *Georgia*, whose Metropolis is *Tessis*. This vast Country is inhabited by *Christians*, *Mabometans*, *Jews*, &c. but is chiefly under the *Ottoman Yoke*.

### S E C T. II.

#### Of the Asiatic Islands.

TYRO. How many Islands are here, and how are they situate?

PHILO. There are a great Number, but the chief are these six, whose Situation is as follows; 1. *Japan Islands*, E. of *China*. 2. The *Philippine Islands*, S. W. of *Japan*. 3. The *Moluccas*, S. of the *Philippine*. 4. The *Sund*, W. of the *Moluccas*. And 5. *Ceyton*, W. of the *Sund*, whose Capital is *Candea*, or *Candy*. And thus much for *Asia*.

### DIALOGUE IV. SECT. I.

#### Of AFRICA.

TYRO. **H**OW is *Africa* situate?

PHILO. *Africa*, the third Quarter of the World, and situate W. on the Globe, is almost surrounded with the *Atlantic*, *Ethiopian*, and *Indian Oceans*, and is extended from thirty-five Degrees of S. Latitude, to about thirty-five N. It is principally divided into eight Parts; viz. *Egypt*, *Barbary*, *Bildulgerid*, *Zaara*, called the *Desart*, *Negro-Land*, *Guinea*, *Nubia*, and *Ethiopia*, besides Islands.



## 1. Of EGYPT.

TYRO. How is *Egypt* situate and divided ?

PHILO. *Egypt* is bounded on the N. by Part of the *Mediterranean Sea*, on the E. by the *Isthmus of Fuez* and the *Red Sea*, on the S. by *Nubia*, on the W. by *Barbary* and the *Desart*. It was formerly called *Misraim*. It is divided into *North Erise*, or *Lower Egypt*, whose Metropolis is *Sabider*, *Upper Egypt*, whose Capital is *Sabid*. And 4. The *Red Sea* and its Coasts, whose Capital is *Coffir*. It lies between twenty-one and thirty-one N. Latitude, and under the fourth and fifth N. Climate, is about six hundred and fifty Miles long, and three hundred broad. It is governed by the *Turkish* Emperor, by a *Bassa*, who resides at *Grand Cairo*.

## 2. Of BARBARY.

TYRO. How is *Barbary* situate ?

PHILO. *Barbary* is bounded on the N. by Part of the *Mediterranean*, on the E. by *Egypt*, on the S. by *Bildulgerid*, and on the W. by Part of the *Atlantic Ocean*. Is extended from twenty-nine to thirty-seven Degrees of N. Latitude, and lies under the fourth and fifth N. Climate. Its Length is two thousand three hundred Miles, and Breadth three hundred and eighty.

*Barbary* is divided into seven different Parts, or Kingdoms ; viz. *Morocco*, *Frez*, *Telenfin*, *Algiers*, *Tunis*, *Tripoli*, and *Barca*, whose chief Towns are of the same Name.

It is chiefly under the Government of the *Grand Turk*, and Emperor of *Morocco*, who is called also Emperor of *Africa*, King of *Morocco*, *Fez*, *Sus*, and *Tassale* ; Lord of *Gago*, *Dara*, and *Guinea*, and *Great Zeriff* of *Mabomet*, and, consequently, their Religion is *Mahometanism*. The longest Day is fourteen Hours one Quarter, and the shortest ten Hours and a Half, as in *Egypt*.

## 3. Of BILDULGERID.

TYRO. How is *Bildulgerid* situate ?

PHILO. *Bildulgerid* is situate on the N. by *Barbary*, on the E. by *Egypt*, on the S. by *Zaara*, on the W. by Part of the *Atlantic Ocean*. It lies between twenty-nine and thirty-one Degrees of N. Latitude, and under the third and fourth N. Climate. Its Length is about two thousand and fifty Miles, and Breadth three hundred. The longest of Days is from fourteen Hours to ten and a Quarter. It is governed by many little Kings, but all subject to the *Great Turk*, or Emperor of *Morocco*.

## 4. Of

## 4. Of ZAARA, or the DESART.

TYRO. How is this *Desart* situate?

PHILO. *Zaara* is bounded on the N. by *Bildulgerid*, on the E. by *Egypt* and *Nubia*, on the S. by *Negro-Land*, and on the W. by the *Atlantic Ocean*.

It is divided into seven Parts; viz. *Borno*, *Gago*, *Bardoa*, *Lempta*, *Targa*, *Zuenziga*, and *Zanbaga*, whose Capital is *Targassa*, the others have the same Names as their *Provinces*. It lies under fifteen and twenty six Degrees of N. Latitude, and under the third and fourth Climate; is in Length about two thousand three hundred and forty Miles, and Breadth about three hundred and thirty. The Days are from ten Hours and a Quarter to thirteen and three Quarters long. Their Government is by several Lords and Kings, called *Xeques*, and they are chiefly *Mabometans*.

## 5. Of NEGRO-LAND.

TYRO. How is the Land of *Negroes* situate?

PHILO. *Negro-Land*, bounded on the N. by *Zaara*, on the E. by *Nubia*, on the S. by *Guinea*, on the W. by Part of the *Atlantic Ocean*. It lies between eight and twenty-two Degrees of N. Latitude, and under the second and third N. Climate. It is computed to be about two thousand two hundred and eighty Miles long, and six hundred broad. It is divided into thirteen *Provinces*; viz. *Genoboa*, *Gelata*, *Tombut*, *Agades*, *Cano*, *Cassena*, *Guangara*, *Melli*, *Mandinga*, *Gago*, *Guber*, *Zegzeg*, and *Zanfara*, whose Capitals are of the same Name. The Days are very little different in Length from those in *Zaara*. It is governed by several Kings, but all, or most, are subject to the King of *Tombut*. Gross Idolatry and *Mabometism* prevail here.

## 6. Of GUINEA.

TYRO. How is this Country situate?

PHILO. *Guinea* is bounded on the N. by *Negro Land*, on the E. by *Ethiopia Exterior*, on the S. by the *Ethiopian Ocean*, and and on the W. by the *Atlantic Ocean*. It is divided into four Parts; 1. The Coast of *Malequette*, whose Capital is *Timan*. 2. The *Ivory Coast* westward, whose Metropolis is *Toba*. 3. The *Golden Coast* eastward, whose Capital is *St. George de Mina*. And 4. The Kingdoms of *Benin*, Metropolis *Arda*. *Guinea* lies between five and thirteen Degrees of N. Latitude. Its Length is one thousand three hundred and twenty Miles, and Breadth about four hundred. It is subject to the Emperor of *Guinea*, and *Paganism* is here observed to equal Height and ridiculous

ridiculous Superstition. Their Days are from eleven Hours three Quarters to twelve and three Quarters.

#### 7. Of NUBIA.

TYRO. How is *Nubia* situate?

PHILO. *Nubia* is bounded on the N. by *Egypt*, on the E. by *Ethiopia Exterior*, on the S. by *Ethiopia Interior*, on the W. by Part of *Zaara* and *Negro-Land*. It lies between fourteen and twenty-two Degrees of N. Latitude, and under the second and third N. Climate. Its Length is about eight hundred and forty Miles, and Breadth about five hundred and seventy. It is divided by the River *Nubia* into N. and S. The Capital of *North Nubia* is *Samna*, and of *South Nubia*, a Town or City of the same Name.

It is governed by its own independent powerful Prince, who is reported to be very humane. Their Traffic is chiefly at *Grand Cairo*. The Length of the Days are much the same as in *Zaara*.

#### 8. Of ETHIOPIA INTERIOR.

TYRO. How is this Country situate?

PHILO. *Ethiopia Interior*, called also the Land of the *Abyssians*, is bounded on the N. by *Nubia*, and on the E. S. and Part of the W. by *Ethiopia Exterior*. It lies under the first, second, and third N. and S. Climates; and the Length is computed three thousand six hundred Miles, and Breadth about two thousand and two hundred. *Ethiopia Interior* is divided into eight Provinces; viz. 1. *Barnagasso*. 2. *Tigremahon*. 3. *Dobassat*. 4. *Fatigar*. 5. *Angote*. 6. *Amara*. 7. *Beleguanze*. And 8. *Begramedri*. This is governed by its own independent Prince, Lord, or Ruler, called *Naggasi*, whose Government is despotical. He styles himself the beloved of God; (says he sprung from the Stock of *Judah*) the Son of the Column of *Sion*, the Son of the Seed of *Jacob*, the Son of the Hand of *Mary*, the Son of *Nabu* after the Flesh, and of *St. Peter* and *Paul* after the Spirit, &c. The longest Day in the most northern Parts of this Country is about thirteen Hours and a Half, and the shortest in the most southern ten Hours and a Half.

#### EXTERIOR.

*Ethiopia Exterior* is bounded on the N. by *Abyssina*, on the E. W. and S. by *Ethiopic Ocean*. And, if to this you take in the Land of the *Hottentots*, it extends to near thirty-five Degrees S. Latitude. It comprehends the Kingdoms of *Biafara*, *Loango*, *Congo*, and *Angola*; the Empires of *Monomungi* and *Monomotapa*; and the Coasts of *Cafres*, *Zanguebar*, *Ajan*, and *Abex*. It is governed by various Princes, and the People are chiefly

chiefly gross *Idolaters* and *Mahometans*. As for the *Hottentots*, they shew no Sign of any Devotion, only very superstitious.

The Days much as in *Ethiopia Interior*.

## S E C T. III.

## Of the AFRICAN Islands.

TYRO. What are the principal Islands in *Africa*?

PHILO. There are many small Islands; but the most noted are comprehended under four Names; viz. 1. The Island of *Madagascar*. 2. *Cape Verde Islands*. 3. The *Canary*. And 4. the *Madeira Islands*.

## I. MADAGASCAR.

This is a large Island, lying S. E. of *Ethiopia*, and extends from eleven to about twenty-five of S. Latitude; is about one thousand Miles long, and four hundred broad. It is called by the *Portuguese* *St. Laurence*, because they first discovered it on that Day. The Inhabitants (except in the eastern Part) are chiefly *Pagans* and *Mahometans*; and are so governed by their Priests (called *Ombiaffes*) that they are under uncommon Superstitions. Thus, if a Child be born upon such a Day, they say it is unlucky, and, therefore, give it to the wild Beasts; and, if a woman dies in Childbed, they bury the living Child with her, because it is better so (they say) than to live without a Mother to take care of it. And thus, by these Priest-cunning and delusive Persuasions, this Island is very thin of Inhabitants. It is under no particular Governor.

## 2. Cape VERDE Islands.

These lie S. W. of *Barbary*, and N. W. of *Guinea*, between thirteen and seventeen Degrees N. Latitude, and are as follows; 1. *St. Anthony*. 2. *St. Vincent*. 3. *St. Zucia*. 4. *St. Nicholas*. 5. *Insula de Sal*. 6. *Bonavista*. 7. *Mago*. 8. *St. Jago*. 9. *Insula del Fuego*. 10. *Brava*. The chief Town is *St. Jago*, subject to *Portugal*.

## 3. The CANARY Islands.

These lie N. of *Cape Verde Islands*, and under twenty-seven and twenty-nine N. Latitude. They are seven in Number; viz. 1. *Lancerota*. 2. *Forte Ventura*. 3. *Canaria*. (Metropolis the same.) 4. *Teneriffe*, famous for its Peak, and the first Meridian in the *French Maps*. 5. *Gomera*. 6. *Ferro*. And 7. *Palma*. They are subject to the King of *Spain*.



## NO THE YOUNG MAN'S

### 4. MEDERA, or MADEIRAS.

This lies in about thirty-two Degrees N. Latitude, and W. of Morocco. Its chief Town is *Tonzal*. It is subject to the *Portuguese*.

TYRO. Are these all the Islands?

PHILO. There are some of less Note; viz. 1. *Zocotora*, subject to the *Arabians*. 2. *Comoro*, N. W. of *Madagascar*. 3. *St. Thomas*. 4. *Prince's Island*. And 5. *Annohon*, subject to the *Portuguese*, lying W. of *Ethiopia*. 6. *St. Helena*, subject to the *English*, lying S. W. of *St. Thomas's*. And 7. *The Isle of Ascension*, N. E. of *St. Helena*. And thus much for *Africa*.

TYRO. I return you thanks, Sir.

PHILO. Now, *Tyro*, for the last Quarter of the World; viz. *America*.

## DIALOGUE V. SECT. I.

### Of AMERICA.

TYRO. WHAT is *America* called, and how is it situate?

PHILO. *America*, called the fourth, or last Quarter of the World, and westward on the Globe.

It is divided into two principal Parts, one called *North*, and the other *South America*.

### I. Of NORTH AMERICA.

TYRO. Why is this called *North America*?

PHILO. Because it lies on the N. Side, or northward of the Equator.

TYRO. Into how many principal Parts is this divided?

PHILO. Into five, as follow; viz. 1. *Mexico*, or *New Spain*. 2. *New Mexico*, called *Granada*. 3. *Florida*. 4. *Terra Canadensis*. And 5. *Terra Arctica*.

### 1. Of MEXICO, or NEW SPAIN.

TYRO. How is this Country situate?

PHILO. *Mexico*, discovered in 1518, and conquered by the Spaniards in 1521, is bounded on the N. by *Nova Granada*, on the E. by the Gulph of *Mexico*, on the W. by *Mare del Zur*, or *Pacific Ocean*, and on the S. by *Terra Firma*. It is very hot, lying chiefly in the torrid Zone, between eight and thirty Degrees of N. Latitude, and is extended to about thirty-eight Degrees of Longitude. The greatest Length is computed to be two thousand five hundred and thirty Miles, and Breadth about four hundred and eighty.

TYRO.

TYRO. Into how many principal Parts is this Country divided?

PHILO. Into three, called *Audiences*; viz. 1. *Guadalajara*, whose Metropolis is the same. 2. *Mexico*. Metropolis the same. And 3. *Guatalama*, Metropolis *St. Jago de Guat.*

1. GUADALAJARA.

This contains the Provinces of *Cinola*, *New Biscay*, *Zaxaticas*, *Guadalajara*, *Chiameltan*, and *Zalisco*.

2. *Mexico* contains the Provinces of *Panuco*, *Mexico*, *Mechoachan*, *Los*, *Angelos*, *Aulequera*, *Tabasco*, and *Jucatan*.

3. *Guatalama* comprehends *Soco Nusco*, *Guatalama*, *Nicaragua*, *Cofla*, *Rica*, *Veragua*, *Honduras*, *Vara*, *Pax*, and *Chiapa*. The longest Day in the most northern Part of this Country is about thirteen Hours and a Half, and in the most southern about twelve Hours and a Half. It is governed by the King of *Spain*, under a Vice-roy, who resides at *Mexico*. There are *Pagans*, *Idolaters*, &c. in some Parts; but the Natives adhere, as in *Spain*, to the most strict Order of *Papacy*.

2. Of NEW MEXICO, called NOVA GRANADA.

TYRO. How is this Part of *North America* situate?

PHILO. This Country was discovered by the *Spaniards* 1540, and is bounded on the N. by *Terra Arctica*, on the E. by *Florida*, on the S. by *Mexico*, or *New Spain*, and on the W. by *California*. Its Bounds are not yet known. The chief Town is *Santa Fel*, the Residence of the *Spanish* Governor.

3. Of FLORIDA.

TYRO. How is this Country situate?

PHILO. *Florida*, discovered also by the *Spaniards* 1497, and possessed by them, 1527, is bounded on the N. by Part of *Terra Arctica*, on the E. by *Carolina*, or Part of *Terra Canadensis*, on the S. by Part of *Mexico* and the *Gulph*, and on the W. by *Mexico* and *California*. It lies between twenty-five and thirty Degrees of N. Latitude, and under the fifth and sixth N. Climate, is extended to twenty-three Degrees in Longitude, and computed to be about one thousand Miles long, and six hundred broad, in its greatest Length and Breadth.

The Natives are gross *Idolaters*, and the main Part is governed by several distinct Lords, or Rulers: but the Places upon, or near the Sea Coasts, are subject to the *Spaniards*. The longest Days in the most northern Part is about fourteen Hours one Quarter, and the shortest in the most southern about nine Hours. Its Metropolis is *Coca*.

4. Of TERRA CANADENSIS.

TYRO. How is this situate, and why so called?

L 2

PHILO.

PHILO. It takes its Name from the River *Canada*. It is bounded on the N. by Part of *Terra Arctica*, on the E. by the *Atlantic Ocean*, on the S. by Part of the Sea and the Island of *Cuba*, and on the W. by *Florida*, *Canada*, &c. It lies between thirty and sixty-two Degrees of N. Latitude, and extends to near forty Degrees of Longitude: is about one thousand eight hundred Miles in Length, and one thousand two hundred and ten in Breadth.

TYRO. But pray, is it not divided into some principal Parts?

PHILO. Yes, into N. and S. The N. comprehends, 1. *Terra Canadensis Propria*. 2. *Nova Britanica*, or *New Britain*. 3. *Nova Francia*, or *New France*. Chief Town *Quebeck*.

TYRO. What does the S. Part contain?

PHILO. 1. *Nova-Scotia*. 2. *New England*. 3. *New York*. 4. *New Jersey*, E. and W. 5. *Pensylvania*. 6. *Maryland*. 7. *Virginia*. And 8. *Carolina*, all in the Possession of, and subject to, the Crown of *Great Britain*.

The Metropolis of these Towns in Order are, 1. *Hallifax* in *Nova-Scotia*. 2. *Boston*. 3. *New York*. 4. *Elizabeth*. 5. *Philadelphia*. 6. *Annapolis Royal*. 7. *James Town*. And 8. *Charles Town*.

N. B. These lie one after another in order from N. to S.

1. *Nova-Scotia*, discovered 1622.

2. *New England*, in 1497, and possessed for *Queen Elizabeth*, by Sir *Philip Armadas*, 1558.

3. *New York*, by Mr. *Hudson*, 1608, and sold to the *Dutch*, who kept it till 1664; at last it was given by *Charles II.* to the *Duke of York*; it was called before *New Netherland*.

4. *New Jersey* was discovered in 1497.

5. *Pensylvania*, about the same Time, was given by *Charles II.* to *William Penn*, Esq; by Letters Patent in 1680.

6. *Virginia* first discovered in 1427, but more particularly in 1584, by Sir *Walter Raleigh* (who is said to be the first that brought Tobacco over to *England*) in the Reign of *Queen Elizabeth*; and was thus called in Honour to her as a *Virgin Queen*.

7. *Maryland* was also discovered by the *English* under the two *Cabots*, 1497, is bounded on the N. by *Pensylvania*, and on the S. by *Virginia*. It has its Name from *Mary*, Wife of *Charles I.* who gave it by Letters Patent under that Name; to the Right Honourable *Cecilius Calvert*, Lord *Baltimore*, 1632.

8. *Carolina* discovered about the Time with *Virginia*, and in 1660 granted, by Patent, to several Noblemen, by *Charles II.*

#### 5. Of TERRA ARCTICA.

TYRO. What do you mean by this Name?

PHILO. It is called *Arctica*, because it comprehends those Countries

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Countries of *America* situate far North, very near the North or *Arctic* Pole, or Polar Circle.

TYRO. Which be they?

PHILO. There are many of them; but the chief, and most noted are, 1. *Greenland*. 2. *Spitsberg*. 3. *Nova Zembla*. 4. *Terra de Jesso*. 5. *New Denmark*. And 6. *New North Wales*.

These are known very little of at present, but barely their Names, therefore cannot be taken any further Notice of.

### II. Of SOUTH AMERICA.

TYRO. Why is this so called?

PHILO. Because it lies chiefly on the S. Side of the Equator.

TYRO. Into how many principal Parts is it divided?

PHILO. Into eight, viz. 1. *Terra Firma*. 2. *Peru*. 3. The Land of the *Amazons*. 4. *Brasil*. 5. *Chili*. 6. *Paraguay*. 7. *Terra Magellanica*. And 8. *Terra Antartica*.

#### 1. Of TERRA FIRMA.

TYRO. How is this situate?

PHILO. *Terra Firma* was discovered in 1494, lies under the first N. Climate, and is bounded on the N. by Part of *Mexico*, on the E. by Part of the *Atlantic*, on the S. by *Peru* and Part of *Brasil*, and on the W. by *Mar del Zur*. It is extended to about twenty-seven Degrees and a Half Longitude, and lies under from one to eleven Degrees and a Half N. Latitude. It is computed to be about fifteen hundred Miles long, and seven hundred and fifty broad.

TYRO. How is it divided?

PHILO. Into E. and W. The E. upon the River *Orinogue*, called 1. *Guian*, whose chief Town is *Manboa*. And 2. *Caribana*, whose Metropolis is *Morebego*. The W. comprehends the Provinces of

1. *Panama*, called also *Terra Firma*; whose chief Town is *Panama*.

2. *Carthagera*, Metropolis the same.

3. *St. Martha*, Metropolis the same.

4. *Rio de la Hacha*, Metropolis the same.

5. *Andaluzia*, Metropolis *Comana*.

6. *Paria*, Metropolis *Maluregvara*.

7. *Granada*, Metropolis *St. Feé de Bagato*.

8. *Papayan*, Metropolis *St. Feé de Antiochia*.

It is governed by the King of *Spain*, by a Vice-roy residing at *Mexico*. The Natives of this Country, especially in the Middle, are gross Idolaters.

#### 2. Of PERU.

TYRO. How is this Country situate?



PHILO. *Peru*, first discovered by the *Spaniards* in 1525, is bounded on the N. by Part of *Terra Firma*, on the E. by *Amazonia*, on the S. by *Chili*, and on the W. by *Mar del Zur*. It lies between twenty-four Degrees of S. and one Degree of N. Latitude, and is extended to twenty Degrees of Longitude, and under the first, second, and third S. Climate.

TYRO. How is it divided?

PHILO. Into six Provinces.

1. *Pesto*, whose Metropolis is *Poston*.

2. *Los Quixos*, whose Metropolis is *Baesa*.

3. *Pacamores*, whose Metropolis is *Valladolid*.

4. *Quito*, Metropolis *Quito*.

5. *Peru*, Metropolis was *Lima*.

6. *Los Carcas*, Metropolis *Potosi*.

The Natives in general are very gross Idolaters, worshipping Sun, Moon, Stars, Thunder, Lightning, &c. But in some Parts there are Christians, &c.

It was quite conquered by the *Spaniards* in 1533, and they have the most considerable Part of it under their Government.

### 3. Of the Land of the AMAZONS.

TYRO. How is this Land situate?

PHILO. This Country, discovered by the *Spaniards* in 1541, is bounded on the N. by *Terra Firma*, on the E. by *Brazil*, on the S. by *Paraguay*, and on the W. by *Peru*.

It lies under the first, second, and third S. Climate. It is under no particular Government: the Inhabitants in general being a savage Sort of People, appearing always in Arms. It is supposed to take its Name from those warlike Women called (by several Poets and Historians) *Amazons*, of whom it is reported they cut off one of their Breasts, not only for the better qualifying themselves to hold their Bows, and shoot the surer, but that they might be the more savage and rapacious.

### 4. Of BRASIL.

TYRO. How is *Brazil* situate?

PHILO. This Country, discovered by the *Portuguese*, in about 1501, is bounded on the N. by *Terra Firma*, on the E. by the *Atlantic Ocean*, on the S. by *Paraguay* and Part of the *Main Ocean*, and on the W. by the Land of the *Amazons*.

It lies between one and twenty-three Degrees of S. Latitude, and under the first, second, third, and fourth S. Climates.

Its greatest Length is computed about one thousand six hundred Miles, and its Breadth about one thousand three hundred and eighty.

TYRO. Into how many principal Parts is it divided?

PHILO. There is not any particular Account of its Provinces, Divisions, &c. but the chief Towns that are known,

or most worthy of Note, are as follows, 1. *St. Vincent*. 2. *Sanctos*. 3. *Angra Dos Reyes*. 4. *St. Sebastian*. 5. *Spiritu Sancto*. 6. *Porto Seguro*. 7. *St. Salvadore*. 8. *Pernambuco*. And 9. *Parayba*.

They are under no particular Government nor Religion, being chiefly sunk into all Ignorance, Idolatry, &c.

#### 5. Of CHILI.

TYRO. How is this Country situate?

PHILO. *Chili*, discovered by the Spaniards about 1554, is bounded on the N. by *Peru*, on the E. by *Paraguay*, on the S. by *Terra Magellanica*, and on the W. by the *Pacific Ocean*.

It lies between twenty-five and forty-four Degrees of S. Latitude, and under the fourth, fifth, and sixth S. Climate.

Its Length is computed to be about eleven hundred Miles.

TYRO. Into how many Parts is *Chili* principally divided?

PHILO. Into three; viz. 1. *Chili Propria*. 2. *Chili Imperial*. And 3. *Chucuito*, whose chief Towns are *St. Jago*, *Balvida*, and *Mandosa*.

It is chiefly governed by the Vice-roy of *Peru*, under the King of *Spain*.

#### 6. Of PARAGUAY.

TYRO. How is *Paraguay* situate?

PHILO. This Country, discovered also by the Spaniards 1546, is bounded on the N. by the Land of the *Amazons* and Part of the Ocean, on the E. by the *Atlantic Ocean*, on the S. by the *Southern Ocean* and *Terra Magellanica*.

TYRO. Whence has it its Name?

PHILO. From the River *Paraguay*; but it is called by the Spaniards (and currently by others) *Rio de la Plata*.

It lies between eighteen and thirty-seven Degrees of S. Latitude, and under the second, third, fourth, and fifth S. Climates, and extends to about thirty-two Degrees of Longitude.

Its Length is computed about twelve hundred Miles, and Breadth about eleven hundred.

TYRO. Into how many principal Parts is it divided?

PHILO. The most material Provinces are five in Number; viz. 1. *Guayra*, whose chief Town is *Ciudad Real*. 2. *Paraguay Propria*, whose chief Town is *Villa Rica*. 3. *Chaco*, whose chief Town is *Conception*. 4. *Tucuman*, whose chief Town is *St. Jago*. And 5. *Rio de la Plata*, whose chief Town is *Assumption*. It is governed chiefly by a Vice-roy.

#### 7. Of TERRA MAGELLANICA.

TYRO. How is this Country situate?

PHILO. It is bounded on the N. by Part of *Paraguay* and *Chili*,

*Chili*, on the E. by the *Atlantic*, on the S. by *Terra Antarctica*, and on the W. and S. by the *Great South Sea*.

It was discovered about 1519, by one *Ferdinand Magellan*, from whom it took its Name.

### 8. Of TERRA ANTARCTICA.

TYRO. How is this Country situate, and why so called?

PHILO. *Terra Antarctica* signifies those Countries that lie between the *Antarctic Circle* and the S. Pole; the chief of which known are, *New Zealand*, *New Guinea*, *New Holland*, and *Terra Australis Incognita*.

## S E C T. II.

### Of the AMERICAN Islands.

TYRO. What are the principal Islands in *America*?

PHILO. They are ten, which are thus divided:

- |                        |   |         |   |  |
|------------------------|---|---------|---|--|
| 1. To the N.           | { | Greater | { | 1. <i>California</i> .                     |
| are                    |   |         |   | 2. <i>Newfoundland</i> .                   |
| 2. Middle the Antilles | { | Lesser  | { | 3. <i>Cuba</i> .                           |
|                        |   |         |   | 4. <i>Jamaica</i> .                        |
|                        |   |         |   | 5. <i>Hispaniola</i> .                     |
|                        |   |         |   | 6. <i>Porto Rico</i> .                     |
|                        |   |         |   | 7. <i>Caribbees</i> .                      |
|                        |   |         |   | 8. <i>Lucayes</i> .                        |
|                        |   |         |   | 9. <i>Sotowento</i> .                      |
|                        |   |         |   | 10. <i>Bermudas</i> .                      |
| 3. S.                  |   |         |   | 11. The Island of <i>Terra del Fuego</i> . |

### 1. Of CALIFORNIA.

This Island was once thought to be a Peninsula, the N. Part was discovered by Sir *Francis Drake* in 1577. It has *Mexico* on the E. and the *Pacific Ocean* on the W. it lies thirty-five Degrees N. Latitude.

### 2. Of NEWFOUNDLAND.

This Island was discovered by the two *Cabots*, in the Time of *Henry VII.* 1497; but more perfectly by *Thorn* and *Elcot* of *Bristol*, in 1527. It lies between forty-seven and fifty-one Degrees of N. Latitude, near *New Britain*.

*Avalon* is its chief Province, which was built upon by Sir *George Calvert* in 1623, by a Patent granted, and afterwards enjoy'd by *Cæcilius Lord Baltimore*. It is subject to the Crown of *England*.

## 3. Of CUBA.

This Island was discovered by the *Spaniards* in 1594. It lies N. of *Jamaica*, N. W. of *Hispaniola*, and S. of the *Babama* Islands, between nineteen and twenty-three Degrees N. Latitude, and extends to about eight Degrees of Longitude. It is subject to the King of *Spain*; and the chief Towns are the *Havanna* and *St. Jago*.

## 4. Of JAMAICA.

This was discovered by one *Columbus*, and possessed by *Penn* and *Venables* in *Oliver's* Time. It was first called *St. Jago*, but afterwards *Jamaica*, in honour of *James* Duke of *York*.

It lies S. of *Cuba*, and W. of *Hispaniola*, and between eighteen and nineteen and one Quarter Latitude, and extends to about three Degrees of Longitude.

It is subject to the *English*. Its chief Town is *Port Royah*.

## 5. Of HISPANIOLA.

This was discovered also by *Columbus* in 1492. It lies between seventeen and twenty Degrees of N. Latitude. It has *Cuba* on the N. W. *Jamaica* on the W. and *Portico Rico* on the E. It is chiefly subject to the Crown of *Spain*; and its principal Town is *St. Domingo*.

## 6. Of PORTO RICO.

*Porto Rico* (once called *Johannis Insula*, and by the Natives *Bonquin*) lies E. of *Jamaica*, about eighteen N. Latitude. It takes its Name from the City and Haven of the same Name.

## 7. Of the CARIBBEE Islands.

TYRO. Why are these Islands so called?

PHILO. From the Inhabitants, who upon first Discovery were found to be *Cannibals*, and the Word is taken for the same. They represent the Segment of a Circle, are about thirty in Number, and extend from about seventeen Degrees N. almost to *Terra Firma*.

The chief among them are, 1. *Anguila*. 2. *St. Martin*. 3. *Sancta Crux*. 4. *Barbada*. 5. *St. Christopher's*. 6. *Nevis*, or *Mevis*. 7. *Antego*. 8. *Montserat*. 9. *Guadalupa*. 10. *Marigalant*. 11. *Dominica*. 12. *Martinico*. 13. *Barbadoes*. 14. *St. Lucia*. 15. *St. Vincent*. 16. *Grenada*. And 17. *Tabago* \*.

\* Note. Some of these belong to the *English*, some to the *French*, and others to the *Dutch*. The chief of these is *Barbadoes*, about thirteen Degrees and a Half N. Latitude. It is subject to the *English*.



## 8. Of the LUCAYES.

TYRO. Why are these so called?

PHILO. From *Lucayone*, the longest of them all. They extend from *Tegesta* in *Florida*, to the N. of *Hispaniola*.

The chief of which are, 1. *Babama*. 2. *Lucayone*. 3. *Cignatio*. 4. *Guanahani*. 5. *Tuma*. 6. *Tawa*. 7. *Samana*. And 8. *Maiaguana*.

The principal of these is *Babama*, near *Cape Florida*, and remarkable for Spiders, they being about two Inches long in general, having six Eyes very visible.

## 9. Of the SOTOVENTO.

These are so called by the *Spaniards*, to whom they chiefly belong, and are found from E. to W. along the Coast of *Terra Firma*. The principal of them are, 1. *Tinidad*. 2. *Margarita*. 3. *Fortuga*. 4. *Orchilla*. 5. *Rocca*. 6. *Bonayre*. 7. *Curacao*. And 8. *Oruba*.

## 10. BERMUDAS.

*Bermudas*, so called from *John Bermudas*, a *Spaniard*, who first discovered it. It lies between thirty-two and thirty-three Degrees of N. Latitude, E. of *Carolina*; viz. about two hundred and forty *English Leagues*, and is subject to the Crown of *Great Britain*.

## 11. Of TERRA DEL FUEGO.

This (according to several *Historians*) is so called, on Account of several *Volcanos*. It is situate S. of *Magellanica*, and parted from the main Continent by the *Streights of Magellan*, lying between fifty-two and fifty-three Degrees S. Latitude.

And thus, TYRO, I have given you a short and concise Account of every Thing, as far as I could in this Compass, and is sufficient to satisfy the Curiosity of any Reader, and to qualify him for the better understanding of such Authors as have wrote more largely upon this Subject.

## DIALOGUE VI. SECT. I.

Between PHILO, a Tutor, and TYRO, his Pupil, concerning the Nature and Description of the GLOBES.

TYRO. WHAT is a Globe, or Sphere?

PHILO. A Globe, or Sphere, is a solid round Body, contained under one Surface; having a Point in the Middle, called the Center, from whence all Lines drawn to the Surface

Surface are equal, and the two Poles are what it involves or turns round upon, (like the Gudgeon of a Water-Wheel) and are represented by those two Pieces of Iron or Wire, upon which the Globe turns: That which has got the Index or Dial-Plate upon it is called the North Pole, and the other is the South Pole.

TYRO. What are the Names of the Globes?

PHILO. One is called the *Terrestrial*, or *Earthly*; the other the *Celestial*, or *Heavenly* Globe.

TYRO. What do they teach us?

PHILO. First, the *Terrestrial* Globe teaches the Knowledge of the Earth and Sea; with the Situation of Places, their Difference of Latitude and Longitude, the Time of the Sun's rising and setting; Length of Days and Nights throughout the Year, and the true Distance from one Place to another, &c.

PHILO. Secondly, the *Celestial* Globe not only teaches us the Sun's rising and setting, but also the rising and setting of any of the fixed Stars; their Declensions and right Ascension, Distance from each other, Time of southing, &c.

## S E C T. II.

TYRO. What are those Lines called that are marked on the Globes?

PHILO. They are called the *great* and *lesser* Circles.

TYRO. What do you mean by a *great* Circle?

PHILO. *Great* Circles are such as cut the Globe into two equal Parts, passing through the Center: all such as do not cut the Sphere in two equal Parts, are called *lesser* Circles.

TYRO. Pray how many are the *great* Circles?

PHILO. 1. The *Equator*, or *Equinoctial*. 2. The *Ecliptic*. 3. *Zodiac*. 4. The *Braxen Meridian*. 5. The *Horizon*. And 6. The *Colures*. Of these in their Order.

1. The *Equator* on the *Terrestrial*, or *Equinoctial* on the *Celestial* Globe, is a Line, or Circle, that cuts the Globe in two equal Parts, dividing the N. from the S. and upon the Globe is easily known by two broad Lines running parallel to each other, and a fine Hair Line between them: It is divided into three hundred and sixty equal Parts, called Degrees, beginning at the first Meridian, (or Sign *Aries*) and is marked from one with ten, twenty, thirty, forty, &c. to three hundred and sixty, quite round; and upon *Senex's* Globes (now *Martin's*) you have under the *Equator*, at the Meridian of *London*, a Cypher thus 0; and from thence are marked the Degrees of Longitude from *London*, with ten, twenty, thirty, &c. to one hundred and eighty Degrees to the Right-hand, or East; and backwards from *London*, with ten, twenty, thirty, &c. to one hundred and eighty, westward\*.

\* See more of this in my Use of the Globes.

2. The *Ecliptic* is another great Circle of the Sphere, which cuts the *Equator* at the two Points, *Aries* and *Libra*, making an Angle at each Point of twenty-three Degrees, thirty Minutes, which is its furthest, or utmost Extent, either N. or S. from the *Equator*.

The *Ecliptic* (like the *Equator*) is divided into three hundred and sixty Degrees, but not numbered from one, ten, twenty, &c. as the *Equator* is, but is divided into twelve equal Parts, containing thirty Degrees each, which are called *Signs*, and have different Names and Characters. Thus,

The NORTHERN SIGNS are,

<i>Aries.</i>	<i>Taurus.</i>	<i>Gemini.</i>	<i>Cancer.</i>	<i>Leo.</i>	<i>Virgo.</i>
♈	♉	♊	♋	♌	♍

The SOUTHERN are,

<i>Libra.</i>	<i>Scorpio.</i>	<i>Sagittarius.</i>	<i>Capricorn.</i>	<i>Aquarius.</i>	<i>Pisces.</i>
♎	♏	♐	♑	♒	♓

You must remember also, that *Aries* ♈ is called the *Ram*; *Taurus* ♉ the *Bull*; *Gemini* ♊ the *Twins*; *Cancer* ♋ the *Crab*; *Leo* ♌ the *Lion*; *Virgo* ♍ the *Virgin*; *Libra* ♎ the *Scales*; *Scorpio* ♏ the *Scorpion*; *Sagittarius* ♐ the *Archer*; *Capricorn* ♑ the *Goat*; *Aquarius* ♒ the *Water-pot*; and *Pisces* ♓ the *Fishes*.

3. The *Zodiack* is a broad imaginary Circle, which extends itself (according to the Rules of *Astronomy*) eight Degrees on each Side of the *Ecliptic*, and is that which contains the twelve Signs, and in which the Planets perform their Revolutions.

4. The *Brazen Meridian* is another great Circle, which divides the *Globe* into two equal Parts. It is represented by a thick *Brass Hoop*, which surrounds the *Globe*, from N. to S. and divides the *Equator* into two equal Parts, viz. the East from the West, and is that on which the *Globe* itself is hung, or turns round upon by its *Axis*, the Extremities of which are called the Poles; that where the Dial-Plate is fixed is called the North Pole, and the other is the South Pole, opposite to it.

TYRO. How is the *Brazen Meridian* marked, or divided?

PHILO. Like the *Equator* and *Ecliptic*, into three hundred and sixty Degrees; but with this Difference, it is divided into four nineties, viz. from the *Equator* towards the N. and S. Poles the *Meridian* is marked with a Cypher over the *Equator* thus, (o) and on each Side, with ten, twenty, thirty, forty, fifty, sixty, seventy, eighty, and ninety, which ends in each Pole. Then again, from each Pole to the *Equator* on the other Half of the *Meridian*, is marked ten, twenty, thirty, forty, &c. to ninety, which ends in the *Equator*.

5. The

5. The *Horizon* is that great Circle which divides the Heavens and Earth into two equal Parts, one called the upper, and the other the lower *Hemisphere*. There are two Sorts, the one called the *sensible*, or *natural*, the other the *rational*, or *mathematical Horizon*, viz.

1. The *sensible Horizon* is that which divides the visible Part of the Heavens from the invisible; and is that great Circle which we see all round us (standing upon any Hill, or at Sea) and seems as if the Heavens and Earth coincided, or joined together.

2. The *rational Horizon* passes thro' the Center of the Earth, is represented by that broad *wooden Circle*, lying with its Face upwards, having two Notches cut in it, one in the N. and the other in the S. Part, in which the *Brazen Meridian* is slipt, or moved up and down, with Pleasure: The Poles of the *Horizon* are the *Zenith* and *Nadir*. Observe further, there are four Circles on the Face of the *wooden Horizon*, viz.

1. The inner Circle, or that Circle at the inward Edge next the Globe, is divided into twelve equal Parts, or Signs, answering to the twelve Signs in the *Ecliptic*, with their Names likewise prefixed to them.


2. Next to these Signs is a *Calender* of Months, according to the *Julian Account*, or *Old Stile*.

3. Next to this is another *Calender*, according to the *Gregorian Account* (done by Pope Gregory XIII. in the Year 1582) called the *New Stile* \*.

*Lastly*. On the outward Verge of the *Horizon* is the Circle of the *Winds*, or *Rhumbs*, viz. the *Mariner's Compass*, being thirty-two in Number (beginning at the N.) each *Point*, or *Rhumb*, contains eleven Degrees one Quarter; for thirty-two multiplied by eleven one Quarter, makes three hundred and sixty.

The Use of the *Horizon* shews the *rising* and *setting* of the Sun, Length of Days and Nights; also the *rising* and *setting* of the Stars in any Latitude; together with the *Azimuth*, *Amplitude*, *Almicanter*; &c. of the Sun, or any Star, and the Point they rise and set upon, &c.

6. The *Coules* are two great Circles, cutting the *Equator* at right Angles, and pass through the Pole of the World.

\*  *Note*. Though this Description of the *Horizon* answers most Globes, yet you are to observe, that on *Senex's Globes* (and I suppose others) made since the Alteration of the *Stile*, the *New Stile* is put upon the inner Circle next the Signs on the *Horizon*, and the *Old Stile* is outward. But this can be no Difficulty; for it is very easy to be seen which is the *New*, and which is the *Old Calendar* on any Globes; the *New* being eleven Days before the *Old*, so that one being known, the other will easily be known also.



The *Solstitial Colure* is that *great Circle* which passes through *Cancer* and *Capricorn*, shewing *Winter* and *Summer*.

The *Equinoctial Colure* passes through *Aries* and *Libra*, and shews the *Spring* and *Autumn*.

### S E C T. III.

*Of the lesser or parallel Circles.*

TYRO. What do you mean by the *lesser*, or *parallel* Circles?

PHILO. All such Circles as do not divide, or cut the Globe into two equal Parts; but that cut off any Segment, or Part, less than the half, are *lesser* Circles.

TYRO. Why are they called *parallel* Circles?

PHILO. Because they are *parallel* every where to the *Equator* \*.

PHILO. They are the *Tropics* and *Polar Circles*.

#### I. *Of the TROPICS.*


TYRO. Pray which are the *Tropic Circles*?

PHILO. Look for the Sign *Cancer* on the Globe, and you will find a Circle drawn with a double Line from thence round the Globe, parallel to the *Equator*, which is called the *North Tropic*, or *Tropic of Cancer*, being twenty-three Degrees and a Half from the *Equator* northward, shewing the Sun's greatest northern Declination. Then looking for the Sign *Capricorn*, you will find the same sort of Circle, which is called the *Southern Tropic*, being also twenty-three Degrees and a Half from the *Equator*, and shews the Sun's greatest southern Declination, or Variation from the *Equinoctial*.

#### 2. *Of the POLAR CIRCLES.*

TYRO. Which are the *Polar Circles*?

PHILO. They are two small Circles, lying near the Poles (*viz.* twenty-three Degrees and a Half Distance) drawn also with double Lines: that on the N. is called the *Arctic Circle*, and that on the S. the *Antarctic Circle*. These Circles are the Poles of the *Ecliptic*.

\*  In the *Latitude*, or *Parallel* of *London*, a Degree contains about thirty-seven Miles on the *Equator*; such are the *Tropics* of *Cancer* and *Capricorn*, the *Polar Circles*, and all other Circles from the North to the South, that run parallel to the *Equator* East or westward; and you are further to observe, that all the Inhabitants under the *Equator*, have their Days and Nights always equal; but if you go further North or South, then the Days are two, three, four, or five Days, or two, three, four, or five Weeks, or two, three, four, or five Months long, as you will see by and by.

TYRO.

TYRO. Pray what is their use, or what do we learn from them?

PHILO. All those Inhabitants that live under these Lines have their longest Day just twenty-four Hours, and their longest Night the same (save the Benefit of Twilight, which is but trifling). If you go further to the Poles, their Days are two, three, and four Days, or two, three, four, or six Months long\*.

## DIALOGUE VII. SECT. I.

*Of the Appendants belonging to the Globes.*

TYRO. **W**HAT do you mean by *Appendants*?

PHILO. *Appendants* are, in some respects, the same as *Appurtenances*, being such necessary Things, both moveable and immoveable, as belong to Globes; the principal, or chief of which, are as follows. 1. The *Index*, or *Hour Circle*. 2. The *Quadrant of Altitude*. 3. The *Semi-Circle*. And 4. The *Nautical Box*.

1. The *Hour Circle*, called also the *Horary Circle*, or *Dial Plate*, is a small Circle of Brass, divided into twenty-four Hours; the upper twelve represents Noon, and the lower twelve Midnight. It is skrewed on the brazen Meridian round the North Pole, and on the Pole itself is placed the *Index*, or *Hand*, which turns round with the Globe.

Its use is to tell the Time of the rising and setting of the Sun, or Stars, in any Latitude; and what o'clock it is in any Part of the World, &c.

2. The *Quadrant of Altitude* is a thin Piece of pliable Brass, divided into ninety Degrees, answering the Degrees of the *Equator*, beginning at the lower End with (o) to ten, twenty, thirty, &c. to ninety. At which Figure it has a Nut, which slips upon the Meridian at pleasure, and is fastened thereto by a Skrew. Its use is to tell the Height of the Sun, or Stars, at any Hour, and when they are due E. and W. Also the Distance of the Stars from one another, and the Distance of one Place from another on the terrestrial Globe, &c. &c. &c.

3. The *Semi-Circle* is of Brass, divided into one hundred and eighty Degrees, answering one Half of the *Equator*. It may be called a double *Quadrant of Altitude*, but is used only in some particular Problems, the *Quadrant*, or *Horizon*, supplying its Place.

\* This and many other Things you will find more fully proved, and better explained, in my Use of the Globes,

4. The *Nautical-Box* is an Instrument used in Navigation, having the thirty-two Points of the Wind marked, or drawn, on a *Card*, or *Sea Chart*, and an Index being touched with the Load-Stone points always northward. This *Card*, or *Chart*, is hung in an *Horizontal Plane*, and fixed on any Part of the *Horizon* of the Globe, or elsewhere, to shew what Point of the Compass you are sailing upon, or are in.

## S E C T. II.

*Concerning the different Names of the Sphere, according to its different Position, or Situation.*

TYRO. What do you mean by the *Sphere's* having different Names according to its Position?

PHILO. There are three Sorts of *Spheres*, viz. a *Parallel*, a *Right*, and an *Oblique Sphere*.

## 1. A Parallel Sphere.

*A Parallel Sphere has this Position.*

1. The Poles are in the *Zenith* and *Nadir*; that is, one Pole is right up, and the other right underneath. 2. The *Equator* will be in the *Horizon*.

*The Property of this Sphere.*

The Inhabitants of this *Sphere* are those that live under the Poles, and have the longest Days and Nights of any other Inhabitants; their shortest Day being twenty-four Hours long, and their longest six Months\*.

## 2. A right Sphere.

*A right Sphere has this Position.*

1. The Poles will lie, or be in the *Horizon*. 2. The *Equator* will be in the *Zenith* and *Nadir*. 3. The *Equator* and all the lesser Circles will cut the *Horizon* at right Angles; viz. perpendicularly.

*The Property of this Sphere.*

The Inhabitants of this *Sphere* are those who live under the *Equinoctial Line*, or *Equator*, and have their Days and Nights always equal; viz. twelve Hours each.

## 3. An Oblique Sphere.

An *Oblique Sphere* is that Position of the Globe, that has the

\* See my Geography, Page 95 and 96.

three following Properties ; viz. 1. One Pole is as much above the *Horizon* as the other is underneath. 2. The *Equator* is Part above, and Part under the *Horizon*. 3. The *Equator* and all the parallel Circles cut the *Horizon* obliquely.

*The Property of this Sphere.*

The Inhabitants of this *Sphere* are those that live in all other Parts, except under the *Poles* and *Equinoctial Line*.

S E C T. III.

*Of the ZONES, or CLIMATES.*

1. *Of the ZONES.*

TYRO. What do you mean by the *Zones* ?

PHILO. A *Zone*, or *Girdle*, is a Tract, or Space, that surrounds the Surface of the Earth, as a *Belt*, or *Girdle* does the Body.

TYRO. How many *Zones* are there ?

PHILO. Three ; viz. 1. *Torrid*. 2. *Temperate*. And 3. *Frigid Zones*.

1. The *Torrid Zone* extends from the *Equator* to the *Tropic* of *Cancer* Northward, and to the *Tropic* of *Capricorn* Southward twenty-three Degrees and a Half each (very nearly) viz. forty-seven Degrees in all.

2. The *Temperate Zones* extend themselves from the two *Tropics* to the *Polar Circles* on both Sides the *Equator* ; viz. forty-three Degrees each, being together eighty-six Degrees.

3. The *Frigid Zones* extend from the *Polar Circles* to the *Poles*, being each twenty-three Degrees and a Half ; viz. forty-seven in Breadth : So that twenty-three and a Half, forty-three, and twenty-three and a Half, make ninety Degrees ; the Distance from the *Equator* to either *Pole*. Or rather thus, the *Torrid Zones* contain forty-seven Degrees, the *Temperate* eighty-six, and the *Frigid* forty-seven, in all one hundred and eighty Degrees.

2. *Of the CLIMATES.*

PHILO. *Climates* are Tracts, or Circles, upon the Surface of the Globe, of such a certain Breadth from the *Equator* to either *Pole*, that the Length of the *artificial Day* (viz. from the Sun rise to Sun set) is just Half an Hour longer than in the next *Climate* nearer the *Equator*, till you come to the *Polar Circles*, and then, indeed, the Day differs in each *Climate* one entire Month.



TYRO. How many *Climates* \* are there that differ by the half Hour, and how many by the entire Month?

PHILO. There are sixty *Climates* in all; viz. thirty on each Side of the *Equator*, called accordingly *North* and *South*: Of these sixty forty-eight of them extend from the *Equator* to the *Polar Circles*, and each differ by Half Hours. And the remaining twelve are contained between the *Polar Circles* and the *Poles*, each differing one entire Month from the other †.

## DIALOGUE VIII. SECT. I.

*An Explanation of the most useful Terms used in Geography and Astronomy.*

TYRO. WHAT are the Names of the Terms used in *Geography* and *Astronomy*?

PHILO. They are chiefly as follows.

1. *Zenith*, which is that Point of the Heavens that is right over Head.

2. *Nadir*, is that Point right under Feet, being directly, or diametrically, opposite to the *Zenith*.

3. *Zenith Distance*, is the Number of Degrees that the Sun, or any Star, wants of ninety Degrees, when they are upon the Meridian or greatest Height.

4. *Altitude*, is Height. *Meridian Altitude* is the greatest *Altitude*, or Height, at twelve o'Clock.

5. *Declination*, is the Distance of the Sun, or any Star from the *Equator*, or *Equinoctial*, counted on the *Brazen Meridian* in Degrees, and is called *North* or *South*, according to which Side of the *Equinoctial* the *Declination* is.

6. *Right Ascension*, is an Arch of the *Equinoctial*, contained between the Sign *Aries*  $\Upsilon$ , and the Degree of the *Equinoctial*, that is cut by the *Brazen Meridian* when the Sun or Star is brought to the Meridian.

7. *Oblique Ascension*, is that Arch or Degree of the *Equinoctial* contained between the Sign  $\Upsilon$ , and the Degree of the *Equinoctial*, which is cut by the *Horizon* at the rising of the Sun or Star.

8. *Oblique Descension*, is just the reverse, being the Degree of the *Equinoctial* cut by the *Horizon* at the setting of the Sun or Star.

9. *Ascensional Difference*, is the Difference of Degrees be-

\* *England* and Part of *Scotland* is in the nineteenth Climate, viz. from about fifty-one and a Half, to fifty-four Degrees and a Half Latitude, that is, near three Degrees Extent.

† See Page 87.

tween the *right* and *oblique Ascension*, which, converted into Time, by allowing fifteen Degrees for every Hour, shews how much the Sun or Star rises or sets before or after six. That is, subtract the *Oblique* from the *right Ascension*, tells the *ascensional Difference*.

10. *Amplitude*, is an *Arch* of the *Horizon*, contained between the true E. and W. Point at the rising and setting of the Sun or Stars, counted in Degrees from the E. and W. Points of the *Horizon* where they rise and set, and is called *North* or *South Amplitude*, accordingly.

11. *Azimuth* is, in effect, the same as *Amplitude*, save only with this Difference; that whereas *Amplitude* is only at rising and setting, *Azimuth* shews the Distance from the E. and W. Points, at any Time, when the Sun or Stars are above the *Horizon* \*.

12. *Elevation* of the Pole is the same as *Latitude*.

*Latitude* of a Place is its Distance from the *Equator*, either *North* or *South*, numbered in Degrees on the *Brazen Meridian*: Or, in other Words, it is the *Elevation* of the Pole above the *Horizon*.

*Longitude* of a Place is an *Arch* of the *Equator*, intercepted between the first *Meridian* (or Point *Aries* ♈) on the *Equator* and the *Meridian* of the Place.

## S E C T. II.

Containing two necessary and useful TABLES; viz.

### T A B L E I.

A TABLE of the Latitude and Longitude of some of the most principal Places, from the latest Observation.

N. B. The Longitude here is taken from the Meridian of London, which is eighteen Degrees E. of the first Meridian *Fero* (on *Senex's* or *Martin's* Globe): So that by adding or subtracting eighteen Degrees, you have the Longitude from the first

\* Note, *Azimuth* is not expressed alike in all Authors. Some call it always *North*, or *South Azimuth*, and reckon the *Azimuth* from these two Points eastward, or westward. Others reckon it from the E. and W. Points, either northward, or southward, which, I think, is best, they being the two Points that *Azimuth* is nearest to in our, or any lesser Latitude, at any Hour: However, it matters not which, if you mind this one Rule; suppose I say, the Sun has sixty Degrees *Azimuth* from the N. eastward, it is the same as if I say he has thirty Degrees *Azimuth* from the E. northward,

Meridian,

Meridian, that is, by knowing one you may know both; the Equator being marked, or graduated, for both.

Places.	Latitude. ° /	Longitude. ° /
<i>Adrinople, Turkey, in Europe</i>	43 30 N.	27 24 E.
<i>Alexandria, Egypt, in Africa</i>	31 25	30 50
<i>Amsterdam, in Holland (and Capital)</i>	52 29	5 15
<i>Babylon, in Chaldea (called Bagdad)</i>	34 45	48 45
<i>Barbadoes, in the West Indies</i>	13 14	59 50 W.
<i>Bengal, in the East Indies</i>	21 00	88 00 E.
<i>Boston, in New England</i>	43 10	69 30 W.
<i>Cadix, Andalusia, in Spain (and Capital)</i>	36 30	5 45 W.
<i>Cairo, Egypt, in Africa</i>	36 5 N.	40 00 W.
<i>Candia, in the Island of Candia</i>	34 55	24 50 E.
<i>Canton, in China</i>	23 12	112 52
<i>Candy, in the Island of Ceylon</i>	8 15	80 30
<i>Cape of Good Hope, S. of Africa</i>	34 45 S.	18 00
<i>Cochin China, East Indies</i>	13 00 N.	107 00
<i>Constantinople, Romania, in Turkey (and Capital)</i>	41 40	29 40
<i>Copenhagen, Capital, Denmark</i>	55 40	12 35
<i>Cracow, Capital of Poland</i>	50 15	20 50
<i>Edinburgh, Capital of Scotland</i>	55 56	3 00
<i>Hague, in Holland</i>	52 10 N.	4 4
<i>Hanover, Saxony, in Germany</i>	52 16	10 0
<i>Jerusalem, Palestine, in Asia</i>	32 44	36 15
<i>Koningsburgh, Prussia, in Poland</i>	54 55	22 15
<i>Lima, in Peru, in South America</i>	11 30 S.	78 40 W.
<i>Lisbon, Capital of Portugal</i>	38 45 N.	8 20
<i>London, Capital of England</i>	51 32	0 0
<i>Madagascar, an Island in Africa</i>	19 26 S.	43 55 E.
<i>Madrid, New Castile, in Spain (Capital)</i>	40 10 N.	3 28 W.
<i>Malta, near Sicily, in Mediterranean</i>	39 10	4 00
<i>Moscow, Capital of Muscovy</i>	55 30	39 30
<i>Nankin, or Nanquin, in China</i>	31 00	118 30
<i>Naples, in Italy</i>	41 45	14 50
<i>St. Omer's, in France</i>	50 50	2 20
<i>Panama, North America</i>	8 30	82 30 W.
<i>Paris, Capital of France</i>	48 45	2 20 E.
<i>Petersburgh</i>	60 00 N.	31 32
<i>Pekin, in China</i>	39 52	110 52 E.
<i>Stockholm, Capital of Sweden</i>	59 30	19 5
<i>Tangier, Barbary, in Africa</i>	35 45	6 00 W.
<i>Tripoli, Barbary, Africa</i>	33 55	13 50

## T A B L E II.

A TABLE of the right Ascension, Declination, Latitude, and Longitude, of some of the most eminent fixed Stars, taken from Senex's celestial Globe, 1754, for the use of the Learner.

Names and Constellations.	R.A. ° ' "	Declin. ° ' "	Lat. ° ' "	Long. ° ' "
<i>Aldebaran</i> , in <i>Taurus</i>	65 15	16 15 N.	4 45 N.	6 00 II
<i>Bellatrix</i> , in <i>Orion</i>	77 30	6 15	15 45	17 00 II
<i>Canopus</i> , in <i>Argo-Navis</i>	95 30	53 0 S.	76 00	10 00 ☿
<i>Castor</i> , in <i>Gemini</i>	109 30	32 30 N.	9 45 S.	16 00
<i>Castor's Brother, Pollux</i> , ditto	111 45	28 30	7 00 N.	19 30
<i>Cor Hydra</i> , <i>Hydra's Heart</i>	138 30	8 15	22 30	24 00 ♋
<i>Cor Scorpio</i> , <i>Scorpio's Heart</i>	243 00	26 00	4 45	5 45 ♏
<i>Cor Leo</i> , called <i>Regulus</i>	148 00	13 00	0 45	26 00 ♌
<i>Dubbee</i> , in <i>Ursa Major</i>	175 00	55 30	47 30	27 30
<i>Fomabant</i>	341 00	31 0	21 00	30 00
<i>Markab</i> , in <i>Pegassus</i>	342 15	13 30	19 00	20 00 ✖
<i>Mencar</i> , in <i>Cetus</i>	41 36	3 15	12 00	10 00 ♄
<i>Procyon</i> , in <i>Canicula</i>	111 00	6 00	15 00	22 00 ☿
<i>Pes Centaurus</i>	216 30	59 30	42 30	26 00 ♍
<i>Regel</i> , in <i>Orion's Foot</i>	75 15	9 15	31 00	12 30 II
1. <i>Star</i> , in the <i>Girdle of Orion</i>	} 79 30	1 00	23 00	17 30
2. ——— ditto		80 30	2 00	18 30
3. ——— ditto		81 15	3 00	19 30 ✖
<i>Scheat</i> , in <i>Pegassus</i>	342 15	26 15	31 00	26 00
<i>Sirius</i> , in <i>Canis Major</i>	98 00	16 30	39 15	12 00 ♀
<i>Upper Pointer</i> , in <i>Ursa Major</i>	161 30	63 30	50 00	12 00
<i>Lower Pointer</i> , ditto	161 20	58 00	46 00	16 00 ♀
<i>Vindemiatrix</i> , in <i>Virgo</i>	192 00	12 30	16 00	5 30



## DIALOGUE IX.

*Containing some useful and necessary Problems on the Terrestrial Globe.*

N. B. ( $^{\circ}$ ) stands for Degrees ( $'$ ) for Minutes.

## P R O B. I.

*The Latitude being given to rectify the Globe for that Place.*

**L**ET it be required to rectify the Globe for the Latitude of *London*  $51^{\circ} 32'$  N. and *Madrid*  $40^{\circ} 10'$  N. proceed thus,

Turn the Pole on which the Dial-Plate is fixed towards the Verge of the *Horizon*, slipping or moving the Globe backwards or forwards, in the Notches of the *Horizon*, till the *Horizon* cuts the *Brazen Meridian* in  $51^{\circ} 32'$  (*viz.* a little more than  $51$  and a Half) so is the Globe rectified for the Latitude of *London*; that is, the N. Pole will then be elevated  $51^{\circ} 32'$  above the *Horizon*; and *London* being brought to the Meridian itself will then be in *Zenith*, or right up, and at equal Distance from all Parts of the *Horizon*.

Depress the Pole till the *Horizon* cuts the *Brazen Meridian* at  $40^{\circ} 10'$ , and you have then the Position of the Inhabitants at *Madrid*, and turning the Globe till *Madrid* comes to the Meridian, you will find it in the *Zenith*, or Top of the Globe, under  $40^{\circ} 10'$ .

*Note.* If it were required to rectify the Globe for South Latitude, then you must elevate the S. Pole to the given Latitude instead of the N. Pole; but this is better explained by the next Problem.

## P R O B. II.

*The Latitude and Longitude of any Place given, to find the same.*

*First,* You are to observe whether the Longitude be reckoned from *London*, or from the first Meridian; for on some Globes the first Meridian begins  $23^{\circ}$ , on others  $20^{\circ}$ , and on *Seyex's* Globes,  $18^{\circ}$  W. of *London*; but if once you know where the first Meridian is on the Globe, it is very easy to know the Difference from the Meridian of *London*.

## EXAMPLE.

There are two certain Places, one has  $18^{\circ}$  N. Latitude, and  $77^{\circ} 5'$  W. Longitude. The other is  $33^{\circ} 45'$  S. Latitude, and  $18^{\circ}$  E. Longitude from *London*; I demand what Places these are.

*Rule.* For the first Place, I elevate to the N. Pole  $18^{\circ}$ , because it is  $18^{\circ}$  N. Latitude. Then I turn the Globe to the Right-Hand,

Hand, or eastward (because the Place lies westward) till  $77^{\circ} 5'$  upon the Equator, counted from the Meridian of *London* (which on *Senex's* Globe has a Cypher thus (o) on the Equator) passes through, or under the Meridian: Or, in other Words, I turn the Globe till  $77^{\circ} 5'$  westward is brought under the Meridian, and here I fix the Globe with a Quill thrust in betwixt the Globe and the *Horizon*; then I look under the Latitude  $18^{\circ}$  (which is in the *Zenith*) on the Meridian a-top of the Globe, and under  $18^{\circ}$  on the Meridian I find *Port Royal* in *Jamaica*, the Place required.

For the second Place, I elevate the S. Pole (though there is no Occasion to elevate the Pole barely to find a Place, but it is better, because you have then the real Situation of the Inhabitants) to the given Latitude  $34^{\circ} 45'$ , and then turn the Globe till  $18^{\circ}$  E. Longitude of *London* come under the Meridian: Then I look under the Latitude  $34^{\circ} 45'$  on the Meridian, and just under this I find the *Cape of Good Hope*, the Place required.

P R O B. III.

*The Latitude of any Place given, to tell all those Places that have the same Latitude.*

D E F I N I T I O N.

All those Places that have the same Latitude, have the Days and Nights of the same Length at the same Time of the Year.

*Rule.* Bring the given Place, or Places, to the Meridian, (suppose *London*  $51^{\circ} 32'$ , and *Madrid*  $40^{\circ} 10'$  N.) then turn the Globe, and all those Places that pass under  $50^{\circ} 32'$ , have the same Latitude as *London*; viz. *Prague*, in *Germany*, &c. and all that pass under  $40^{\circ} 10'$ , have the same Latitude as *Madrid*, which you will find to be *Pekin* nearly for one, and many other Places.

P R O B. IV.

*To tell the Difference of the Latitude of Places.*

Here are two Variations, or Rules.

*First*, If the Latitudes be both N. or both S. then subtract the less from the greater Latitude, and the Remainder is the Difference, or Answer. Thus between *London* and *Madrid* is  $12^{\circ} 32'$ , the first being  $50^{\circ} 32'$ , and the other  $40^{\circ}$ . And between *Candy* and *Stockholm* is  $52^{\circ} 30'$ , for *Stockholm* is about  $59^{\circ} 30'$  N. and *Candy*  $7^{\circ} 30'$  N.

*Secondly*, If one Place lie on the N. and the other on the S. Side of the Equator; (that is, if one be N. and the other S. Latitude) then add them both together, and their Sum is the Difference of the Latitude required.

Thus

Thus *Copenhagen* is  $55^{\circ} 40'$  N. and the Island of *Madagascar* is  $19^{\circ} 30'$  S. these added together make  $75^{\circ} 10'$ , the Difference of Latitude required.

## P R O B. V.

*The Longitude of any Place given from any Meridian, to tell those Places having the same Longitude.*

This is done after the same Manner as the other, only here the Answer will be on the *Equator*, as the others were on the Meridian.

I would know what Places have the same Longitude as *London*, and the same Longitude as *Moscow*.


The Rule is, Bring *London* to the Meridian, then all those Places on the Globe (from the N. Pole to the S. Part of the *Horizon*) that lie under the Edge of the Meridian, have the same Longitude as *London*. Thus *Fort Nassau*, and *Fort Mina* in *Guinea* have the same, or very nearly the same Longitude as *London*.

And *Moscow* in *Muscovia* has very nearly the same Longitude as *Aleppo* in *Syria*: Also *Scandaroon*, *Antioch*, and *Tripoli* in *Syria* have the same Longitude; viz.  $37^{\circ} 30'$  from *London*.

## P R O B. VI.

*To tell the Difference of the Longitude of Places.*

## DEFINITION.

 1. No Place can exceed, or be above,  $180^{\circ}$  of Longitude from another Place; for  $181^{\circ}$  E. Longitude is with more Propriety  $179^{\circ}$  W. Longitude, for  $181^{\circ}$  taken from  $360^{\circ}$  there remains  $179^{\circ}$ , which is nearer to the given Place than  $181^{\circ}$ .

Rule. Here are two Variations.

First, If the Places lie both E. or both W. of the first Meridian, or where you reckon the Longitude from; viz. if they both be E. or both W. Longitude, then subtract one from the other you have the Difference.

Thus I find *Jerusalem* has  $36^{\circ} 15'$  E. Longitude from *London*, and *Pekin*  $110^{\circ} 52'$  E. Longitude; therefore I subtract  $36^{\circ} 15'$  from  $110^{\circ} 52'$ , and there remains  $74^{\circ} 37'$  Difference of Longitude E. or W. that is, *Pekin* is  $74^{\circ} 37'$  E. Longitude of *Jerusalem*; or *Jerusalem* is  $74^{\circ} 37'$  W. Longitude of *Pekin*.

Secondly, If one Place be E. and the other W. Longitude of the first Meridian (suppose *London*, or any other Meridian) then add their Longitudes together, and the Sum is the Difference of Longitude required.

## EXAMPLE.

I would know the Difference of the Longitude between *Jerusalem*  $36^{\circ} 15'$  E. of *London*, and *Port Royal* in *Jamaica*  $77^{\circ} 5'$  W.

Here as one is E. and the other W. I add  $36^{\circ} 15'$ , and  $77^{\circ} 5'$  together, and their Sum makes  $113^{\circ} 20'$  Difference of Longitude. That is, *Jerusalem* is  $113^{\circ} 20'$  E. of *Port Royal*, or *Port Royal* is  $113^{\circ} 20'$  W. of *Jerusalem*.

## EXAMPLE.

*Pekin* in *China* is  $110^{\circ} 52'$  E. Longitude, and *Port Royal* is  $77^{\circ} 5'$  W. I add these Sums together, and find it  $187^{\circ} 57'$  Difference of Longitude; but because it is more than  $180^{\circ}$ , I subtract  $187^{\circ} 57'$  from  $360^{\circ}$ , and there remains  $172^{\circ} 3'$ , the Difference required.

Most of the following Problems are common to both Globes.

## P R O B. VII.

*The Day of the Month given to find the Sun's Place in the Ecliptic.*

*Rule.* The Day of the Month being given, look on the inner Calender on the new Globes, and you have the Sign and the Degree of that Sign that the Sun is in for that Day, according to the *New Stile*.

If it be upon old Globes, look on the outward Calender, you have the Sign and the Degree of the Sign.


*N.B.* You may further observe, that the Calender used throught *Europe* is the Calender for *N. S.* viz. *New Stile*, and is always known from the other, because it has the *Saints Days*, and several other Things wrote upon it on the *Horizon*.

## EXAMPLE.

I would know the Sun's Place in the Ecliptic on *May* the 21st, *N. S.* *March* the 21st, *June* the 21st, *September* the 22d, and *December* the 21st.

I look for these Days of the Months in order as they stand in the new Calender; (viz. for *N. S.* before described) and right against the Day of the Month in the innermost Circle on the *Horizon*, I find the Sun's Place among the Signs as follows:

Thus right against *May* the 21st, I find  $1^{\circ}$  of  $\Pi$  *Gemini*: And also on *March* the 21st, I find he enters  $\gamma$  *Aries*: On *June* 21st he enters  $\text{♋}$  *Cancer*: On *September* the 22d he enters  $\text{♎}$  *Libra*: And on *December* the 21st he enters  $\text{♏}$  *Capricorn*.

 *Note*, That in every Problem and Operation hereafter, except *Old Stile* be mentioned, it is to be understood for *New Stile*; viz. *N.S.* and Latitude always means *N. Latitude*, except expressed *South*.



## P R O B. VIII.

*The Sun's Place given to find the Day of the Month.*

This is only the reverse of the former Problem; for having the Sun's Place given, seek it in the innermost Circle among the Signs; then against that Degree in the Calender *N. S.* you have the Day of the Month required.

## E X A M P L E.

I would know what Time of the Year the Sun is in  $1^{\circ}$  of  $\Pi$ , as also when he enters  $\Upsilon$ ,  $\mathcal{E}$ ,  $\mathcal{Z}$ , and  $\mathcal{V}$ ? Proceed according to the Rule, and you will find the Days to be *May* the 21st, *March* the 21st, *June* the 21st, *September* the 22d, and *December* the 21st, as in the last.

## P R O B. IX.

*The Latitude and Day of the Month given, to find the Sun's Place in the Ecliptic, and rectify the Globes for use.*

*Rule.* Find the Sun's Place on the *Horizon* by *Prob. VII.* and having noted what Degree he is in, look upon the *Ecliptic* on the *Globe*, and find the same Sign and Degree as you did on the *Horizon*, then bring this Degree of the *Ecliptic* very carefully to the graduated Edge of the *Brazen Meridian*, and holding the *Globe* steady turn the *Index* exactly to the upper twelve, (which represents twelve at Noon) and thus is the *Globe* rectified for that Day, and the Degree of the *Ecliptic* that lies under the *Equator*, represents the Sun's Place at Noon, or twelve o'Clock, that Day.

☞ The *Astronomer's* Day is reckoned from, or begins at twelve o'Clock; and, if you fix the *Quadrant* of *Altitude* to the *Latitude* in the *Zenith*, the *Globe* will be compleatly rectified,

## P R O B. X.

*To tell the Declination of the Sun on any Day of the Year.*

*Rule.* Having found the Sun's Place in the *Ecliptic* for the given Day, bring it to the *Brazen Meridian*, and observe what Degree of the *Meridian* it lies under, and whether it be on the *N.* or on the *S.* Side of the *Equator*, for that is the *Declination* required, which is called *N.* or *S.* *Declination* accordingly. Thus on *April* the 21st the Sun has  $11^{\circ} 30'$  *N.* *Declination*, and on *May* the 21st he has  $20^{\circ} 30'$  *Declination*, but on *October* the 27th he has  $12^{\circ} 30'$  *South Declination*.

P R O B.

## P R O B. XI.

*The Latitude and Day of the Month given, to tell the Sun's Meridian Altitude; viz. his Height at Noon.*

*Rule.* Bring the Sun's Place to the Meridian, and observe what Degree of the Meridian the Sun's Place is under; for those Degrees on the Meridian that are intercepted, or lie between the S. Verge of the *Horizon*, and the Degree which is over the Sun's Place on the Meridian, (counted on the Meridian) is the Sun's Meridian Altitude required.

Thus I find his Meridian Altitude at *London*, *May* the 21<sup>st</sup>, to be  $59^{\circ}$ ; but on *November* the 5<sup>th</sup> he has but  $23^{\circ} 30'$  Altitude.

## P R O B. XII.

*The Latitude and Day of the Month given, to tell the Sun's Altitude at any Time.*

*Example.* On *May* the 21<sup>st</sup>, at nine in the Morning, and at five in the Afternoon at *London*, I would know the Sun's Altitude or Height.

*Rule.* Rectify the Globe for the Latitude, and bring the Sun's Place ( $1^{\circ} \text{II}$ ) to the Meridian, and the Index to the upper twelve on the Dial-Plate; then skrew the Quadrant of Altitude in the Zenith, (*viz.* the left Edge of the Nut must be fixed on the Meridian at  $51^{\circ} 30'$ ) then turn the Globe till the Index points to the Hour, *viz.* nine in the Morning; this done, fix the Globe by thrusting in a Quill between it and the *Horizon*; lastly, turn the Quadrant about till the graduated or figured Edge touch the Sun's Place, (*viz.*  $1^{\circ} \text{II}$ ) and the Degrees on the Quadrant, counted from the *Horizon* upward on the Quadrant, is his Height at that Time; *viz.*  $43^{\circ} 30'$ . Then turn the Globe till the Index points to five in the Afternoon; and also turn the Quadrant on the W. Side, (without unskewing it) till it touches the Sun's Place, and you have about  $24^{\circ}$  on the Quadrant, his Altitude at that Time.

*N. B.* At *North Cape* (*viz.* N. Latitude  $72^{\circ}$ ) at nine in the Morning *May* 21, he will be but about  $32^{\circ}$  high.

## P R O B. XIII.

*The Latitude given, to tell the rising and setting of the Sun, and Length of the Day and Night at any Time of the Year in any Place.*

*Rule.* Rectify the Globe (*viz.* elevate it for the Latitude, bring the Sun's Place to the Meridian, and Index to the upper twelve) then turn it till the Sun's Place comes even with, or lies right against the inner Verge on the E. Side of the *Horizon*,

then the Index will shew you the Time of the Sun's rising; turn it to the W. Side or Verge of the Horizon, and the Index will shew you the setting. Or thus, having got the Hour the Sun rises, count how many it wants of twelve, for so many Hours will it set after. Thus, if the Index points to four in the Morning at rising, it will of course set at eight at Night, &c.

*Note 1.* If you double the Time of rising, that is, double the Hours it wants of twelve at the Time of rising, it gives you the Length of the Day from Sun rising to setting.

*Note 2.* If you subtract the Length of the Day from Sun rising to Sun setting, from twenty-four, the Remainder shews you the Length of the Night, Twilight included. See Prob. 25.

Proceed thus, and you will find the Sun, on *May 26*, at *London*, to rise about four in the Morning, and sets at eight at Night. Now double what he wants of twelve at rising, viz. eight Hours, and it gives the Length of that Day at *London*, viz. sixteen Hours.

#### P R O B. XIV.

*To tell the Sun's right Ascension.*

Bring the Sun's Place to the *Brazen Meridian*, and note what Degree of the *Equator* is cut by the Meridian, for that is his right Ascension required.

I would know the Sun's right Ascension on *March* the 21st, *June* the 21st, *September* the 22d, and *December* the 21st.

I find the Sun's Place for these different Days, and bringing it to the Meridian I find the Meridian cuts the *Equator* in (0) in (90) in (180) and in (270°) his right Ascension required.

*Note.* When the Sun enters  $\Upsilon$ , *March* the 21st, he has no right Ascension, because it is counted from, or begins at  $\Upsilon$ ; therefore, on *March* the 20th, he must have his greatest right Ascension, viz. 359°.

#### P R O B. XV.

*To find the Sun's oblique Ascension and Descension at any Time, and in any Latitude.*

*Rule 1.* Rectify the Globe for the Latitude, and bring the Sun's Place down to the eastern Verge of the *Horizon*, then observe what Degree the *Horizon* cuts the *Equator* in, for that is the oblique Ascension required.

2. Turn the Globe till the Sun's Place comes to, or lies level with the western Verge of the *Horizon*, and the Degree of the *Equator* cut by the *Horizon*, is the oblique Descension required.

Thus

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Thus on *March* the 21st, *June* the 21st, *September* the 22d, and *December* the 21st, viz. when the Sun enters  $\Upsilon$ ,  $\text{♋}$ ,  $\text{♎}$ , and  $\text{♏}$ , you will find his oblique Ascension at *London* to be (o) (56) (180) and (304).

And on the same Days his oblique Descension will be (o) (123) (180) and (237 and a Half).

## P R O B. XVI.

*The Latitude and Day of the Month given, to tell the Sun's ascensional Difference; viz. how much he rises, or sets, before and after six; and, consequently, to tell the Length of the Days, suppose there were no Index to the Globe.*

*Rule.* By the last Problem find the Sun's right and oblique Ascension; then subtract the oblique from the right Ascension, or the contrary, and the Remainder is the ascensional Difference required; which divide by fifteen, the Degrees of the *Equator* that pass through the Meridian for one Hour (or seven and a Half for Half an Hour) gives the Answer in Time that the Sun rises and sets before and after six.

Thus on *May* the 26th I find the Sun  $6^\circ$  of  $\text{♊}$ , and his right Ascension is  $64^\circ$ , and on the same Day his oblique Ascension is  $34^\circ$ ; now  $34^\circ$  from  $64^\circ$ , there remains  $30^\circ$ , his ascensional Difference; which divide by fifteen gives two Hours, the Time that he rises before, or sets after six.

*N. B.* The right exceeds the oblique Ascension from  $\text{♏}$  to  $\text{♎}$ , when the Sun rises before six; but the other half Year that he rises after, or sets before six, the oblique exceeds the right Ascension.

## P R O B. XVII.

*The Latitude and Day of the Month given, to tell the Sun's Amplitude, viz. his Distance from the E. and W. Points at his rising and setting, and the Points of the Compass he rises and sets upon*

*Rule.* The Globe being rectified, bring the Sun's Place to the eastern Verge of the *Horizon* (which shews his rising) then the Degrees upon the innermost Circle of the *Horizon*, counted from the true E. Point to the Place where the Sun's Place lies against on the *Horizon*, shews you the Sun's Amplitude.

Proceed according to the Rule, you will find the Sun's Amplitude at *London*, (*May* the 21st) at rising to be about  $34^\circ$  from the E. to the N. and at setting  $34^\circ$  from the W. to the N. and the Point he rises upon is N. E. by E. and he sets N. W. by W. But on *November* the 5th he has about  $25^\circ$  and a Half Amplitude from the E. to the S. and at setting  $25^\circ$  and a Half from



the W. to the S. The Point he rises upon is E. S. E. and the Point he sets upon is W. S. W.

## P R O B. XVIII.

*The Latitude and Day given to tell the Sun's Azimuth, viz. his Distance from the E. and W. or from the N. and S. Points at any Time.*

*Rule.* Rectify the Globe in general, then turn the Globe till the Index points to the given Hour; this being done, turn the Quadrant till it touches the Sun's Place for the given Day; and then the Quadrant will cut the *Horizon* in the *Azimuth* required from the E. or W. Points, or from the N. or S. Points, for you may reckon from either, only then name it properly and accordingly.

Thus on *August* the 17th, at nine in the Morning, the Sun will have about  $30^{\circ}$  *Azimuth* from the E. to the S. or, which is the same,  $60^{\circ}$  from the S. to the E. for  $60^{\circ}$  and  $30^{\circ}$  make  $90^{\circ}$ , the whole Quarter from E. to S.

*N. B.* Some Authors call this  $60^{\circ}$  S. Amplitude; but others call it  $30^{\circ}$  S. Amplitude; that is,  $30^{\circ}$  from the E. to the S. as I said before.

## P R O B. XIX.

*The Latitude, Day, and Hour given, to tell the Sun's Almicanter.*

## DEFINITION.

Almicanterers are Circles of Altitude that run parallel to the *Horizon*, whose Poles are the *Zenith* and *Nadir*; so that you may imagine as many Circles of Altitude, viz. Almicanterers, as you please.

*Rule.* The Almicanter is found the same as the Altitude of the Sun at any Time, therefore I refer you back to *Prob. XIII.*

## P R O B. XX.

*The Latitude and Length of the Day given, to tell what other Day of the Year will be of the same Length.*

*Rule.* Having found the Sun's Place for the given Day, bring it to the Meridian, and observe well its Declination; then turn the Globe till some other Degree of the *Ecliptic* comes under the same Degree of Declination under the Meridian; this being done, see what Day of the Month answers to the Sun's Place then under the Meridian, for that is the Day required, which you may easily prove.

Thus you will find that *July* the 13th, and *August* the 20th, is of the same Length as *May* the 26th and *April* the 17th.

P R O B.

## P R O B. XXI.

*The Latitude and Day given, to tell the beginning, ending, and (consequently) the Length, or Continuance of Twilight.*

## D E F I N I T I O N.

Twilight is that faint Light which begins immediately after Sun sets in the Evening, till he is  $18^{\circ}$  below the *Horizon*; and it begins in the Morning when the Sun comes within  $18^{\circ}$  of the *Horizon* on the E. Side, and ends when he rises. Therefore it is plain, that Twilight is not only longer when Days encrease in Length, but it is also much stronger, as you will see presently by the work of the *Problem*.

TYRO. I have heard that this *Problem* is very difficult to what some are?

PHILO. It is something longer in its Operation, but very easy, if you mind the Rule and the Operation together.

## O B S E R V A T I O N.

*Note*, You were told that Twilight begins and ends when the Sun is  $18^{\circ}$  below the *Horizon*, and as the Quadrant of Altitude reaches no lower than the *Horizon*, therefore the Rule is this,

Rectify the Globe and bring the opposite Degree of the Sun's Place to the Quadrant of Altitude, so that it touches just  $18^{\circ}$  on the Quadrant (then it is plain that the Sun's real Place will be depressed  $18^{\circ}$  below the *Horizon*) then look on the Index, for that will point (if among the Morning Hours) to the beginning or (if among the Evening Hours) ending of Twilight.

*Note 1.* What I mean by the opposite Place of the Sun is this; it is that Degree of the Ecliptic opposite to, or  $180^{\circ}$  from the given Place of the Sun. Thus, suppose the Sun was in  $\Upsilon$ , then I bring its opposite Sign (*viz.*  $\cap$ ) to  $18^{\circ}$  on the Quadrant, so will  $\Upsilon$  be depressed  $18^{\circ}$ , and the Index will shew the Hour.

*Note 2.* There is no real Night at *London* (but Twilight) from *May* the 22d, to *July* the 20th, the Sun all that Time being less than  $18^{\circ}$  below the *Horizon*.

Proceed then accordingly to the Rule, and you will find that on *March* the 21st, and *September* the 22d, Twilight begins about four in the Morning, and ends about eight at Night.

The Sun on these Days you know rises and sets at six. Add, therefore, the Length of Morning and Evening Twilight to twelve Hours (the Length of the Days then) and it gives sixteen

teen Hours, this subtracted from twenty-four Hours, leaves eight Hours, the Length of the real, or dark Night.

So also on *April* the 24th, Twilight begins about half past two, ends about half past nine, which is in all seven Hours. But on *December* the 20th it begins at six, and ends at six, which is in all but three Hours and forty Minutes.

## P R O B. XXII.

*The Hour given, where you are to tell what Hour it is in any other Part of the World.*

*Rule.* Bring the given Place to the Meridian, and set the Index at the given Hour; then turn the Globe till the other Place, or Places, come under the Meridian, and the Index will point to the real Time in the Place required.

*Example.* When it is two o'Clock in the Afternoon at *London*, I would know the Time at *Jerusalem*, and at *Port Royal* in *Jamaica*?

Proceed according to the Rule, and you will find, that when it is two in the Afternoon at *London*, it is twenty-five Minutes past four at *Jerusalem*; and but fifty-two Minutes past eight in the Morning at *Port Royal*.

Or thus by *Problem VI.* *Jerusalem* is  $36^{\circ} 15'$  E. Longitude of *London*, I divide, therefore,  $36^{\circ} 15'$  by fifteen, and the Quotient is two Hours, and the Remainder is six, which is six Times four, or twenty-four Minutes, and the odd fifteen Minutes or Miles, is one Minute, so that the Difference is two Hours twenty-five Minutes; and as *Jerusalem* is E. of *London*, it has its Hour before us, therefore it is twenty-five Minutes after four in the Afternoon. And thus for other Places.

## P R O B. XXIII.

*The Day of the Month given, to tell those Inhabitants that will have the Sun in their Zenith (or over their Heads) on that Day.*

## O B S E R V A T I O N.

This cannot happen to any other Inhabitants, but in the *Torrid Zones*, that is, to all such as have not above  $23^{\circ}$  and a Half of Latitude, either North or South.

*Rule.* Bring the Sun's Place to the Meridian, and observe exactly his Declination for that Day; then turn the Globe any way, and observe what Places pass under that Degree of Declination on the Meridian; for all such will have the Sun right over their Heads some Time or other on that Day.

I would know what Inhabitants, or Places, will have the Sun in their Zenith on *May* the 21st.

Proceed

Proceed as directed by the Rule, you will find *St. Jago* in *Hispaniola*, *St. Jago* in *Cuba*, *Campechy*, and many other Places will pass under that Degree of Declination, (*viz.*  $20^{\circ}$  N.) and will have the Sun in their *Zenith* that Day.

Also on *April* the 16th, the Inhabitants of *Porto-Bello*, the *Oronoko* Islands, *Bay of Siam*, *Isle of Ceylon*, and the *Philippine* Islands, will have the Sun that Day in, or near, their *Zenith*.

P R O B. XXIV.

*The Day and Hour given in any Place, to tell those Inhabitants, or that Place, to which the Sun is then vertical; viz. in the Zenith.*

*Rule.* Bring the given Place to the *Brazen Meridian*, and turn the Index to the given Hour; this done, turn the Globe till the Index points to the upper twelve, or Noon; then look under the Degree of Declination on the Globe for that Day, for that is the very Spot, or Place, to which the Sun is then vertical.

*Example.* On *May* the 13th, at eight Minutes past five in the Afternoon, at *London*, I would know what Place has the Sun then in their *Zenith*. Answer, *Port Royal* in *Jamaica*.

*N. B.* There are two Days in which the Sun is vertical to all the Inhabitants in the *Torrid Zones*; which must be when the Sun has the same Declination, and in this Problem will be *July* the 27th, *viz.* the same Declination as on *May* the 13th.

Thus also you will find when it is thirty-three Minutes past six in the Morning at *London*, on *April* the 12th, and *August* the 28th, the Inhabitants at *Candy* in the *Island of Ceylon*, will have the Sun then nearly in their *Zenith*.

P R O B. XXV.

*To tell the Distance from one Place to another in Degrees and Minutes (viz. Miles) in an Arch of a great Circle, \* as also their Bearing, or Situation, in respect of each other.*

*Rule.* Bring one of the Places to the *Meridian*, and elevate the Globe for the Latitude of it, and fix the *Quadrant* in the *Zenith*: then turn the Globe till the *Quadrant* touches the other Place, and the Degrees on the *Quadrant* between Place and

\* *Note*, Sixty Miles, or Minutes, are reckoned a Degree in general; but this is a vulgar Error, for it is proved that every Degree on the Earth's Surface in every great Circle (such as the *Equator*, *Meridian*, &c.) is sixty-nine Miles and a Half; therefore multiply the Degrees by sixty-nine and a Half, you have the Distance in *English Miles*

Place



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Place shews the Distance; and the Quadrant at the same Time will cut the *Horizon* in the Point of the Compass, called the Bearing, or Situation, from the first Place.

*Example.* I would know the Distance from *London* to *Port Royal*, *Jerusalem*, and *Moscow*, as also their Situation in Respect of *London*?

Proceed according to the Rule, and you will find that from *London*

	Deg.		Miles.
To <i>Port Royal</i>	$68\frac{1}{2}$	} viz. nearly {	$4760\frac{3}{4}$ W.
To <i>Jerusalem</i>	$33\frac{1}{4}$		$2311$ E.S.E.
To <i>Moscow</i>	$23$		$1598\frac{1}{2}$ E.N.E.

## P R O B. XXVI.

*The Latitude and Day given, to tell what Time the Sun will be due East or West.*

*Rule.* Rectify the Globe and Quadrant as before directed: then turn the Quadrant till it touches the E. or W. Point of the *Horizon*; this done, turn the Globe till the Sun's Place for the given Day comes to the Edge of the Quadrant (holding the Quadrant to the E. or W. Point) so will the Index point to the Hour of his being due E. or W. on that Day.

Proceed thus, and you will find about five Minutes past seven in the Morning, on *May* the 21st at *London*, the Sun will be due E. and about five Minutes before five in the Evening due W. On *June* the 21st, he will be due E. about twenty-two Minutes past seven in the Morning, &c. but on *December* the 21st, he is due E. about thirty-five Minutes past four in the Morning, and due W. about twenty-five Minutes past seven in the Evening.

## P R O B. XXVII.

*To find the Antæci to any Place.*

### 1. EXPLANATION:

*Antæcians* are those Inhabitants that have the same Longitude; that is, lie under the same Meridian, but have the same Latitude South as we have North.

#### 2. Their Property.

1. Their Hour is the same as ours at all Times. 2. Their Days are equal to our Nights, and their Nights to our Days. And 3. Their Summer is our Winter.

#### 3. To find the Antæci to any given Place (suppose *London*).

Bring *London* to the Meridian, and count on the Meridian from

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from the Equator as many Degrees Latitude South as *London* has North, (*viz.*  $51^{\circ} 32'$ ) and there make a Dot, for that is the Place of the Antœci.

### P R O B. XXVIII.

*To find the Periceci to any Place.*

#### I. EXPLANATION.

The *Periœci* are those that lie under the same Parallel of Latitude, but have one hundred and eighty Degrees Difference of Longitude.

##### 2. Their Property.

1. They have contrary Hours, *viz.* Noon. 2. Their Days and Nights are of the same Length with ours. Their Seasons are also the same as ours.

##### 3. Rule to find them.

Bring *London* to the Meridian, and turn the Globe till one hundred and eighty Degrees of Longitude pass under the Meridian, then under the same Latitude as *London*, (*viz.* under  $51^{\circ} 32'$  North Latitude) make a Dot, for that is the Place of the *Periœci*, to be in the *Great South Sea*  $51^{\circ} 32'$  S. Latitude, and  $180^{\circ}$  Longitude.

Thus also the *Antipodes* to *Cape Antonia* in *South America*, is the Bay of *Nankin* in *China*. And the *Antipodes* to *Barbadoes*, is a little Shoal in the Straights of *Sapy*.

### P R O B. XXIX.

*To find the Antipodes.*

#### I. EXPLANATION.

*Antipodes* are those that live diametrically opposite to us; that is, have the same Latitude South as we have North, but differ in one hundred and eighty Degrees of Longitude,

##### 2. Their Property.

These Inhabitants have 1. Their Hour is contrary to ours, 2. Their longest Day is our shortest. 3. Their Day is our Night. And 4. Their Summer is our Winter, &c.

##### 3. To find them.

There are three Ways, but the two best are these,

1. Bring *London* to the North Verge of the Horizon, which is done by slipping the Globe up and down till *London* lies close to the Edge of the Brazen Meridian, and close to the Horizon on the North: This being done, look on the South Verge of the

the Horizon close to the Brazen Meridian, and there make a Dot on the Globe, and you have the *Antipodes*.

2. Bring *London* to the Meridian, and turn the Globe till  $180^{\circ}$  pass thro' the Meridian, and there fix the Globe, then count from the Equator southward on the Meridian  $51^{\circ} 32'$ , and you will find the same Dot to lie close to the Meridian (at  $51^{\circ} 32'$ ) below the South Part of the Horizon.

## P R O B. XXX.

*The longest Day in any Latitude given (supposing London, sixteen Hours and a Half) to tell in what other Latitude the longest Day is one, two, three, &c. Hours longer than in the given Place.*

*Rule.* Rectify the Globe for the given Latitude (*viz.* *London*) and bring the solstitial Colure (*viz.*  $\odot$ ) to the Meridian; then where the *Horizon* cuts the Tropic of  $\odot$ , make a Dot on the Tropic at the Verge of the *Horizon*: This done, turn the Globe westward, till  $7^{\circ}$  and a Half of the *Equator* pass under the Meridian, and then make a second Dot on the Tropic against the *Horizon* as before; then turn the Globe back to its first Position, (*viz.* to  $\odot$ ) and then elevate the Pole, till the second Dot appears at the Edge of the *Horizon*, and the *Horizon* at the same Time will cut the Meridian in the Latitude required.

Proceed as above, and you will find that in the Latitude  $56^{\circ} 20'$ , the Days are one Hour longer than at *London*.

2. If you want to know the Latitude where the Day is two Hours longer than at *London*, then proceed as before, only instead of causing  $7^{\circ}$  and a Half to pass under the Meridian, you must now turn the Globe till  $15^{\circ}$  pass under the Meridian, and make then a second Dot on the Tropic and proceed as before.

*Note.* If you want to know the Latitude where the longest Day is an Hour shorter than at *London*, only turn the Globe eastward instead of westward, till seven Degrees and a Half pass thro' the Meridian, and make a Prick on the Tropic, and depress the Pole till this lies even with the *Horizon*, you will find the Latitude about  $45^{\circ}$  and a Half. Thus for two Hours longer about  $60^{\circ}$ , for four Hours about  $64^{\circ} 20'$ ; but for two Hours shorter the Latitude is about  $35^{\circ}$  and a Half.

## P R O B. XXXI.

*Any Time not exceeding six Months given, to tell that Latitude, or those Places, where the Sun will not set for all that Time.*

*Note.* That twenty-eight Days are here reckoned to the Month. Bring the given Time into Days, and take the Half of the Number of

of Days; but remember to abate one, if the Half exceeds thirty, then count from *Cancer* on the Ecliptic the same Number of Degrees as the Half amounted to, and where this Reckoning ends make a Dot on the Ecliptic. *Lastly*, Bring this Dot to the Meridian, and as many Degrees as are intercepted, or lie between the Dot and the Pole itself, counted on the Meridian, is the Latitude required.

*Example.* I demand the Place, or Latitude, where the Sun does not set for the Space of four Months and sixteen Days?

This is in all one hundred and twenty-eight Days, the Half is  $64^{\circ}$ , abate  $1^{\circ}$  is  $63^{\circ}$ ; this I count from  $\odot$  on the Ecliptic, and make a Dot, and bringing it to the Meridian, I find there are nearly  $80^{\circ}$  between the Dot and the Pole; *viz.* the Latitude is  $80^{\circ}$ , which is at *Smith's Inlet*, the upper Part of *Greenland*.

So also in the Latitude of  $85^{\circ}$ , he sets not for five Months two Weeks. And in the Latitude of  $86^{\circ} 30'$ , for five Months, three Weeks, and three Days; and in the Latitude  $90^{\circ}$ , not for six Months; as you will see by the next Problem.

## P R O B. XXXII.

To tell in the Latitude ninety (the longest Day there being six Months) how long it continues to be Twilight after Sun set; and how long their Night is after Twilight ends, before Twilight begins again.

*Note*, Remember you were told before, that Twilight begins and ends when the Sun is  $18^{\circ}$  below the *Horizon*, and that on *September* the 22d the Sun begins to set to the Inhabitants at the North Pole, and to rise to the Inhabitants at the South Pole; so that Twilight begins *September* the 22d to the Inhabitants at the North Pole; therefore

*Rule.* 1. Elevate the Pole to the *Zenith*, and turn the Globe till some Degree of the Sun's Place in the Ecliptic lies under  $18^{\circ}$  of the Brazen Meridian, and under the S. Part of the *Horizon*, and you will find it  $24^{\circ} 17'$ ; *viz.* *November* the 14th, the ending of Twilight, that is, they have Twilight from *September* the 22d, to *November* the 14th, and then they begin to have dark Nights (save the Advantage of the Moon) till the 24th of *January*. For

2. Turn the Globe till some other Point of the Ecliptic comes under  $18^{\circ}$  as before, and you will find it about  $5^{\circ}$  of  $\text{---}$ , which answers to the 24th of *January*, the Beginning of Twilight to the Inhabitants at the N. Pole, and then on *March* the 21st, he rises with them.

Thus it appears, that the Length of their Day (from Sun-rising to Sun-setting) is from *March* the 21st, to *September* the 21st. The Length, or Continuance, of Twilight, is from



September the 21st, to November the 14th, and from January the 24th to March the 21st, in all about one hundred and ten Days, and their real Night is from November the 14th, to January the 24th, viz. about seventy-one Days.

*Note*, The same holds good to the southern Inhabitants at the S. Pole, for he rises with them when he enters  $\varpi$ , and sets with them when he comes to  $\Upsilon$ , &c.

## DIALOGUE X. SECT. I.

*Containing some useful Problems on the Celestial Globe.*

### P R O B. I.

*To find the right Ascension of any Star.*

**B**RING the Center of the Star to the Meridian, and the Degree of the Equinoctial, cut by the Meridian, is the right Ascension required.

Thus you will find the right Ascension of *Aldebaran* in *Taurus*, to be about  $65^{\circ}$ , *Arcturus* in *Bootes*, about  $210^{\circ} 45'$ , *Regel* in *Orion*, about  $75^{\circ} 30'$ , and *Sirius*, or the *Dog Star*, about  $98^{\circ}$ , &c. &c.

### P R O B. II.

*The Latitude given, to tell the oblique Ascension and Descension of any Star.*

Rectify the Globe, and bring the Star down to the eastern Verge of the *Horizon*, and the Degree of the Equinoctial that is then cut by the *Horizon*, is the *oblique* Ascension required. Turn the Star to the western Side, and the Degree of the Equinoctial, cut by the *Horizon*, is the Star's *oblique* Descension.

Proceed thus, and you will find the *oblique* Ascension of *Regel* to be about  $86^{\circ} 30'$ , of *Marbal* in *Pegasus*, about  $325^{\circ}$ , and of *Aldebaran*, or *Bull's Eye*, about  $43^{\circ} 30'$ . Turn each of these to the western Side, you will find their *oblique* Descension  $64^{\circ}$ ,  $360^{\circ}$  nearly, and  $87^{\circ}$ .

*Note*, There is this Difference between the right and oblique Ascension and Descension of the Sun and Stars. For the Sun's oblique Ascension, &c. differ every Day in the same Latitude, but the Stars oblique Ascension is every Day the same.

### P R O B. III.

*To tell the Declination of the Stars.*

As for the Sun's Place, so also here, bring the given Star to the *Braxen Meridian*, and observe what Degree of the Meridian lies

lies right over the Center of the Star, for that is the Declination either N. or S. according to which Side of the Equinoctial it lies.

Thus you will find the Declination of *Aldebaran* to be about  $16^{\circ} 45' N.$  The upper Pointer to the Pole (in *Ursa Major*) about  $63^{\circ} \frac{1}{2}$ , and the lower one nearly  $58^{\circ} \frac{1}{2}$ , but *Regel* in *Orion* I find about  $8^{\circ} \frac{1}{4} S.$  and *Cor Scorpio* about  $26^{\circ} S.$  Declination, &c. &c.

P R O B. IV.

*The right Ascension and Declination of any Star given, to find the same at once.*

Bring the given Degree of right Ascension on the Equator to the *Brazen Meridian*, then look under the Degree of Declination on the *Meridian*, and you will find the Star at the *Meridian*, under the given Degree of Declination.

Thus, suppose I wanted to find *Aldebaran*, whose right Ascension is  $65^{\circ}$  and his Declination  $16^{\circ} 45' N.$  I first bring  $65^{\circ}$  of the Equinoctial to the *Meridian*; and looking under  $16^{\circ} 45' N.$  Declination on the *Meridian*, I find *Aldebaran*.

So also *Sirius* has  $98^{\circ}$  right Ascension, and  $16^{\circ} 30' S.$  Declination; therefore I bring  $98^{\circ}$  of the Equinoctial to the *Meridian*, and looking under  $16^{\circ} 30' S.$  Declination on the *Meridian*, I find *Sirius* just at the *Meridian*. The same for any other Star.

P R O B. V.

*To tell the rising and setting of the Stars, and the Point of the Compass any Star rises or sets upon in any Latitude, and on any Day of the Year.*

Rectify the Globe, and bring the Sun's Place to the *Meridian*; then turn the Globe till the given Star comes to the eastern Verge of the *Horizon*, and the Index will point to the Time of rising, and the *Horizon* will shew the Point it rises upon: Turn it to the West, and the Index will point to the Time of setting, and the *Horizon* will shew you the Point it sets upon.

Proceed thus, and you will find that *Aldebaran*, on *November* the 5th, at *London*, rises a little past six in the Evening, and sets about nine in the Morning. The Point he rises upon, is E.N.E. and the Point he sets upon, is W.N.W. But *Regel* in *Orion*, the same Night, rises a little before nine at Night, and sets about half past seven in the Morning. The Points of rising are W. by S. and setting E. by S.

*Note*, The Stars rise and set every Day on the same Point of the Compass, though at contrary Hours.

## P R O B. VI.

*To tell the Time, viz. how many Hours any Star continues above the Horizon, from its rising to its setting, in any Latitude.*

Rectify the Globe, then bring the Star to the eastern Verge, and note the Time of rising, then turn the Globe to the western Side; and the Number of Hours that passed through the Dial-plate tells you the continuance of that Star above the *Horizon*.

Thus, I find *Aldebaran* at *London* continues up from the Time of his rising on any Day (for Example take *December* the 25th) about fifteen Hours; and *Regel* about ten Hours and half.

At *Stockholm* *Aldebaran* continues up above sixteen Hours; but at *Port-Royal* he continues up but about twelve Hours three Quarters.

## P R O B. VII.

*To tell the Distance of one Star from another in Degrees and Minutes, in the Arch of a great Circle.*

To this Problem are three Variations;

1. If the Stars lie under the same *Meridian*, bring them to the *Brazen Meridian*, and the Degrees intercepted between them, counted on the *Meridian*, is the Distance required.

Thus, I find, the two Pointers in the *Great Bear*, to be about  $5^{\circ} \frac{1}{2}$  distant from each other; and *Eridef* and the *Dolphin's Eye* about  $29^{\circ} \frac{1}{2}$  distant.

2. If they lie under the same declination, bring the first (at Pleasure) to the *Brazen Meridian*, and note the Degrees cut by the *Equator*; then bring the other to the *Meridian*, and note how many Degrees difference has passed through the *Meridian*, for that is their Distance required.

Thus, I find, the Difference between *Affengue* and *Caput Medusæ* to be about  $122^{\circ} \frac{1}{2}$ ; for *Affengue* ( $38^{\circ} \frac{1}{2}$  Declination) being brought to the *Meridian*, cuts  $277^{\circ} 30'$  viz.  $82^{\circ} 30'$  from  $\Upsilon$  westward; and *Caput Medusæ* cuts  $40^{\circ}$  of the *Equator* eastward; their Distance, therefore, is  $122^{\circ} 30'$ .

3. If neither of the Stars lie under the same Degree of the *Meridian*, or Declination, then bring either of them to the *Meridian*, and elevate the Pole to the same Height as the Star has Declination (that is, the same as you elevate the terrestrial Globe to the Latitude of a Place) for then the Star will be in the Zenith: Therefore, fix the Quadrant to the Zenith, over the Center of the given Star, and extend it to the other Star, and the Degrees on the Quadrant is the Distance required in a true Arch of a great Circle.

*Note*, Though the Distance of the Stars from each other are thus determined in Degrees, yet you are not to suppose their Distance is so many

many Degrees to be converted into *English* Miles; but it only means, that they appear so far distant under such an Angle.

Thus, I find the Distance between *Capella* and *Cor Hydra* to be about  $79^{\circ}$ , and between *Aldebaran* and *Sirius*, about  $46^{\circ} 30'$ , &c.

4. If the Stars be at such a Distance from each other, that the Quadrant will not reach them, then bring either of them to the *Horizon*, and elevate, or depress the Pole, till the other lies also at the Verge of the *Horizon*, and the Degrees counted upon the *Horizon*, between Star and Star, is their Distance in Degrees.

Thus, between *Aldebaran* and *Cor Scorpio* you will find about  $170$  Degrees.

P R O B. VIII.

*The Latitude, Day of the Month, and Height of any Star given, to tell the Time or Hour of the Night.*

*Rule.* Rectify the Globe for the Latitude, &c. &c. then fix the Quadrant in the Zenith, and move the Globe and the Quadrant together, till the Star cuts the Quadrant in the given Height; and the Index will point to the Hour.

Thus, on *January* the 21st (at *London*) in the Evening I observed *Aldebaran* E.S.E. to be about  $40^{\circ}$  high; I demand the Time of this Observation? *Ans.* A little past five in the Evening. Again, on *December* the 25th, in the Evening, I observed *Sirius* to be about  $15^{\circ}$  high, and at the same Time *Regel* to be about  $28^{\circ} \frac{1}{2}$  high; I demand the Hour? *Ans.* About ten at Night; and *Aldebaran* is under the *Meridian* at the same Time.

P R O B. IX.

*To tell what Stars never rise, and those that never set at London.*

1. Only observe what Stars have above  $38^{\circ} \frac{1}{2}$  N. Declination; for all such never set at *London*, but are always above the *Horizon*.

2. Observe also those Stars that have above  $38^{\circ} \frac{1}{2}$  S. Declination, for those never rise, but are always under the *Horizon* at *London*.

Thus, the Pointers in the *Great Bear*, *Aridef* in *Cygnus*, and many others, never set.

Also, *Canopus* in *Argo*, *Navis* and *Pes Centaurus*, and many others, never rise at *London*.

*Note, 1.* From what you have been taught, *Tyro*, it is easy to conceive, that to the Inhabitants under the North Pole no South Star can ever be seen; nor can the Inhabitants at the South Pole ever see one of the Stars in the other Hemisphere. But,



2. The Inhabitants under the *Equator* have a pleasant Sight of all the Stars from Pole to Pole; for they rise and set with them at right Angles; therefore no Star can continue above twelve Hours above this *Horizon*.

## P R O B. X.

*To know at any Time of the Year (in the Latitude of London) where to find any Star, or tell the Name of any Star at pleasure.*

Rectify the Globe for the Day, and turn it till the Index points to the given Hour; then by a Quadrant take the Height of the required Star; or, for want of this (in a common way of guessing) observe well what Part of the Heavens it is in; viz. whether E. N.E. S.W. or the like, as also its Height as near as you can guess: This being done, set the Globe in due Order for the Day and Hour, and you will find the same Star on the Globe; and, by applying the Quadrant, you will find the exact Point of the Compass, and the real Height the Star then has, which, tho' not perhaps near to what you guessed it at, yet, if it be any noted Star, you may assure yourself you were right, as there is no other Star of Note near it about that Height, and upon the same Point.

Thus, on *December* the 25<sup>th</sup>, at eight at Night, I observed a bright Star (as near as I can guess) on the S.E. Point, and about 48° high; I would know what Star it is? *Ans. Aldebaran.*

I rectify the Globe, and turn the Index to the Hour, and then turn the Quadrant to the given Point of the Compass, and looking about 48° high on the Quadrant, I find *Aldebaran* to be the nearest bright Star by the Quadrant on that Point and Height; therefore, I conclude it is *Aklebaran*.

Also at three Quarters past ten, the same Night, I see two very bright Stars, one on, or near, the *Meridian*, about 30° high, and the other near the S.E. Point, and about 35° high; I demand their Names? *Ans. Regel and Procyon in Canicula.*

## P R O B. XI.

*To tell the Latitude and Longitude of the Stars.*

First, Observe whether the given Star be on the N. or S. Side of the *Ecliptic*; for if it be on the N. Side, elevate the N. Pole 66°  $\frac{1}{2}$ , and turn the Globe till  $\odot$  and  $\sphericalangle$  lie in the N. and S. Points of the *Horizon*; viz. the *Ecliptic* will be parallel, or even to the *Horizon*, and fix the Quadrant in the *Zenith*: Then keeping the Globe steady, turn the Quadrant till the Edge of it touches the Center of the Star, and that Degree on the Quadrant (viz. the Altitude of the Star in the Latitude 66°  $\frac{1}{2}$ ) is the

the Latitude required, and the Degree of the Ecliptic, cut by the Quadrant, reckoned from *Aries* (or rather reckoned among the Signs, as it happens) is the Longitude required.

Thus you will find *Arcturus* in *Bootes* to be about  $30^{\circ} \frac{1}{2}$  N. Latitude, and  $203^{\circ}$  Longitude from  $\varphi$ , or rather  $23^{\circ}$  of  $\Delta$ . Also, *Alcair* is about  $29^{\circ} \frac{1}{2}$  of N. Latitude, and  $28^{\circ}$  of Longitude in  $\varphi$ .

2. For any South Star.

Elevate the S. Pole  $66^{\circ} \frac{1}{2}$ , and fix the Quadrant in the Zenith, and apply it to the Star, as before directed, you have the Latitude and Longitude required. Thus you will find *Pes Centaurus* to have about  $42^{\circ} \frac{1}{2}$  of S. Latitude, and  $236^{\circ}$  Longitude from  $\gamma$ , or rather  $26^{\circ}$  in  $\mu$ ; and thus for any other Star.

P R O B. XII.

*The Latitude and Day of the Month given (suppose December 25, at nine at Night at London) to set the Globe so as to represent the Face of the Heavens at that Time, and shew your Acquaintance the Name and Position of the most eminent fixed Stars.*

Rectify the Globe for the Latitude, and bring the Sun's Place to the Meridian, and the Index to twelve. Then turn the Globe to the given Hour, viz. five Minutes past nine at Night, and there fix it, so will every Star on the Globe (if you set the Globe N. and S.) correspond with, or point to, the same Star in the Heavens.

Thus (at London) I find *Capella* E. by S. about  $75^{\circ}$  high, *Castor* and *Pollux*, one about  $40^{\circ}$  and the other about  $45^{\circ}$  high; near the E. Point. *Procyon* below them, to the left Hand,  $23^{\circ}$  high E.S.E. *Sirius* yet lower, to the left, S.E. about  $10^{\circ}$  high; *Betelgeuze* higher, on the same Point, about  $38^{\circ}$  high; *Regel*, more southward, about  $26^{\circ}$  high; *Aldebaran*, on the same Point, much higher; viz. about  $53^{\circ}$ ; the *Seven Stars* or *Pleiades*, S. nearly about  $62^{\circ}$  high; *Mencar*, S. by W.  $40^{\circ}$  high; *Aridef*, N.W. about  $26^{\circ}$  high, &c. &c. &c.

P R O B. XIII.

*To tell the Time of the acronical rising and setting of any Star.*

DEFINITION.

1. The *acronical* rising of a Star, is when the Star rises just at the sun-set.

2. A Star is said to set *acronically*, when it sets with the Sun.

Bring the Sun's Place for the given Day, to the western Side of the *Horizon*, and all those Stars that are on, or near the eastern Side of the *Horizon*, rise *acronically*; and those on the western Verge of the *Horizon* set *acronically*.

Thus

Thus I find on *December* the 6th, that *Aldebaran* rises *acronically*, but it sets *acronically* on *May* the 21st. Also *Sirius* rises *acronically* on *February* the 4th, and sets *acronically* on *May* the 14th.

## P R O B. XIV.

To tell the cosmical rising and setting of the Stars in any Latitude.

## DEFINITION.

1. A Star is said to rise *cosmically*, when it rises with the Sun.
2. A Star is said to set *cosmically*, when it sets at sun-rising.

Rectify the Globe, &c. and bring the Sun's Place to the eastern Side of the *Horizon* for the given Day; then all those Stars cut by the eastern Verge of the *Horizon* rise *cosmically*. The Globe still remaining in the same Position, look at the western Verge, or Edge of the *Horizon*, and all those Stars cut by it, or that are very near it, set on that Day *cosmically*.

Thus I find that *Arcturus*, and two small Stars in *Hercules's* Thigh, rise *cosmically*, *September* the 25th. Also two Stars in *Eridanus*, *Assengue* in *Lyra*, &c. &c. set *cosmically*. *Marhal* in *Pegasus*, is but just below the *Horizon*, therefore may be said to set nearly *cosmically*, as it will within a Day or two.

For the cosmical setting.

Turn the Globe till the Star comes to the western Side of the *Horizon*, and observe the Degree of the *Ecliptic*, then cut by the eastern Side of the *Horizon*, for that will answer to the Day of the *cosmical* setting.

Thus *Arcturus* sets *cosmically*, *June* the 22d. Also *Aldebaran* sets *cosmically*, *December* the 20th.

## P R O B. XV.

To tell the heliacal rising, or setting, of the Stars.

## DEFINITION.

1. *Heliacal* rising, is when a Star once in the Sun's Beams gets out of them, so as to be seen at the eastern Verge of the *Horizon*, just before sun-rising.
2. *Heliacal* setting, is when a Star once in the Sun's Beams gets out of them, so as to be seen setting on the western Side of the *Horizon*, just after sun-set.

*Note 1.* This *heliacal* rising and setting of the Stars is different, according to their different Magnitudes. For,

*Note 2.* Stars of the first Magnitude are seen rising and setting, when the Sun is but  $12^{\circ}$  below the *Horizon*. Stars of the second Magnitude are not perfectly seen till the Sun is  $13^{\circ}$  below the *Horizon*. Those of the

the third Degree, when he is  $14^{\circ}$ . Those of the fourth Degree of Magnitude, when he is  $15^{\circ}$  below the *Horizon*. Those of the fifth Degree, when he is  $16^{\circ}$ . Those of the sixth Degree, when he is  $17^{\circ}$ ; and the *nebulous*, or small ones, not till he is  $18^{\circ}$  below the *Horizon*; viz. about the beginning and ending of Twilight.

To find the *beliacal* rising, or setting, the Rule is, rectify the Globe, and bring the given Star to the eastern Verge of the *Horizon*; then fix the Globe, and turn the Quadrant to the western Side, till  $12^{\circ}$  of the Quadrant touches the Ecliptic; this done, note the Degree of the Ecliptic, that is, cut by  $12^{\circ}$  of the Quadrant on the western Side (for then will the real Place of the Sun be depressed  $12^{\circ}$  on the eastern Side) for that Degree sought in the Calender gives the *beliacal* rising. The same is to be observed with the Quadrant on the eastern Side for the *beliacal* setting. Thus you will find *Aldebaran* rises *beliacally*, July the 4th, sets *beliacally*, May the 5th.

And *Sirius* the Dog Star rises *beliacally*, about August the 26th \*.

\* N. B. The Poets, and others formerly, used to reckon their *Dies Caniculares*, or Dog Days, from the *beliacal* rising of *Sirius*; but they did not agree when they ended. Some reckoned them to continue thirty or forty, and others fifty Days. However, in this they agreed, that the weather at that Time was very sultry and faint for five or six Weeks after the rising of *Sirius*. But (as it was then, so now) it is a ridiculous Whim; for *Sirius* does not now rise *beliacally* till near September, though our Almanack-makers (for what Reason I know not) continue the beginning of Dog Days, July the 30th. But, however, it is plain that *Sirius* can no ways be charged with bringing this sultry weather; because three or four thousand Years hence he will not rise *beliacally* till November, and then, perhaps, will be charged with bringing as much Cold by the same Rule.

## S E C T II.

*Containing some useful Problems in Navigation.*

### P R O B. I.

*The Sun's Declination and Hour, when he is due East given, to find the Latitude; viz. the Elevation of the Pole.*

Rectify the Globe to the same Latitude as the given Number of Degrees of Declination, and fix the Quadrant in the Zenith; then convert the Hours that the Sun is due E. before, or after, six o'Clock, into Degrees, and count the same Number of Degrees on the *Horizon* from the east Point southward, and bring the Quadrant to that Degree of the *Horizon*, so shall the Degree on the Quadrant that is cut by the Equator be the Complement  
of



of Latitude, which taken from  $90^\circ$ , gives the Latitude itself, or Height of the Pole.

*Example.* Sailing May the 21<sup>st</sup>, I made an Observation that the Sun was due East about seven Minutes past seven in the Morning, and his Declination  $20^\circ$  N. I demand what Latitude I was in?

Proceed by the Rule, you will find the Latitude to be  $51^\circ \frac{1}{2}$  nearly.

## P R O B. II.

*Having the Sun's Azimuth at six o'Clock, and Declination, to find the Latitude.*

*Rule.* As many Degrees as are contained in the *Azimuth* given, so much elevate the Pole, and fix the Quadrant in the *Zenith*, and bring  $\gamma$  to the Meridian: This done, count on the Quadrant upwards, the Complement of the Sun's Declination to ninety, and bring that Degree to the *Equator*, then the Degree of the *Horizon*, cut by the Quadrant, shall be the Complement of Latitude, counted from the S. Point, or else from the N. as it may happen, and the Remainder to ninety is the Latitude required; or otherwise, the Degrees counted from the other two cardinal Points, either E. or W. as it may happen, will give the Latitude.

Thus I find the Sun's *Azimuth*, at six o'Clock, to be  $12^\circ 35'$ , and his Declination  $20^\circ 10'$ , what is the Latitude? Work according to the Rule, you will have the Answer  $38^\circ \frac{1}{2}$  Complement, that is  $51^\circ \frac{1}{2}$  Latitude required.

## P R O B. III.

*The Sun's Amplitude and ascensional Difference given, to find the Elevation of the Pole and Sun's Declination.*

*Rule.* Raise, or elevate, the Pole so many Degrees as is the ascensional Difference, and fix the Quadrant in the *Zenith*, and bring  $\gamma$  to the Meridian, then count on the Quadrant upwards the Complement of Altitude, and move the Quadrant till that same Number on the Quadrant cuts the *Equator*; and the Quadrant will cut the *Horizon* in the Degree of the Pole's Elevation, and the *Equator* in the Degree of Declination.

*Example.* I made an Observation, that the Sun's ascensional Difference was  $27^\circ 10'$ , and his Amplitude  $33^\circ 20'$ , I demand the Latitude and Declination?

## P R O B. IV.

*The Sun's Altitude E. and his Declination given, to prove the Elevation of the Pole.*

**Rule.** Elevate the Pole to the Complement of the Sun's Altitude at E. and fix the Quadrant in the Zenith, and bring  $\Upsilon$  to the Meridian, then Number on the Quadrant of Altitude the Degree of Declination, and bringing the same to the Equator, observe what Degree the Quadrant cuts the Equator in; for its Complement to  $90^\circ$  is the Height of the Pole.

**Example.** The Sun's Declination is  $20^\circ 10'$  N. his Altitude at E. (at London) is nearly  $26^\circ$ , I would know whether the supposed Latitude ( $51^\circ \frac{1}{2}$ ) agrees herewith in Operation?

Here I subtract  $26^\circ$  from  $90^\circ$ , and there remains  $64^\circ$  Complement of Altitude, and I elevate the Pole accordingly, &c. Then I bring  $\Upsilon$  to the Meridian, and cause  $20^\circ 10'$  on the Quadrant to cut the Equator, and find it nearly  $38^\circ \frac{1}{2}$ , the Complement of Latitude required; which, subtracted from  $90^\circ$  gives  $51^\circ \frac{1}{2}$ , the real Latitude of the Place.

## P R O B. V.

*The Sun's Declination and Amplitude given, to find the Height of the Pole.*

**Rule.** Elevate the Pole to the Complement of Amplitude, and fix the Quadrant in the Zenith, and bring  $\Upsilon$  to the Meridian, then count the Sun's Declination on the Quadrant, and bring that Degree to the Equator; and the Degree of the Equator, cut by the Quadrant, is the Latitude required.

**Example.** Suppose the Sun's Amplitude  $33^\circ 20'$ , his Declination  $20^\circ 10'$ , what's the Latitude?

Proceed according to the Rule, you will find it about  $51^\circ 30'$ .

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THE  
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PART III.  
GEOMETRY.  
DIALOGUE I. SECT. I.

TYRO. **W**HAT is *Geometry* and its Use?

PHILO. *Geometry* shews the Relation or Proportion of one Line to another; as also how to measure irregular Figures, by first turning them into equal regular Figures; it is now indeed used for, and considered only as the Science of Quantity, or Extension.

TYRO. From whence had *Geometry* its Rise?

PHILO. There are various Opinions concerning this, nor is it of any Signification to us; but 'tis plain from the Authority of many, that in *Egypt* it was improved in the following Manner: The River *Nile* every Year overflowed the Country and covered the Land with Mud, which obliged the Inhabitants to set down Doles or large Stakes, and then they drew Marks from each and platted every Man's Property; and from this they drew Figures similar to those in the Mud, and by a further Practice brought *Geometry* to a greater degree of Perfection.

SECT.

## S E C T. II.

*Geometrical Definitions.*

TYRO. Please to define or explain such Things as are necessary to the Knowledge of this Science.

PHILO. Things previous to be understood, are only such Figures consisting of various Forms, and which have a Connexion or Dependence on one another, and ought to be got so by Heart as to remember the Names and their Use at the first Sight. They are as follows,

1. A *Point* or *Dot* is a Thing considered as the very Beginning, or Formation of Motion or Magnitude, and without Parts of itself, as the Point A, Fig. 1.

Fig. 1.

A.


2. A *Line* is generated from a Point moving or proceeding from its first Place to any other Place in a direct Line, Fig. 2.

Fig. 2.

A ————— B

3. A *Curve* Line also is made by the Motion of a Point moving indirectly till it rest at C, Fig. 3.


Fig. 3.

B  C

4. An *Angle* is made by the meeting together of two Lines in one Point, and it matters not at all whether one Line (or Leg) of the Angle be longer than the other.

Fig. 4.

If one Line stands right up or perpendicular upon the other, it is called a *right Angle*, (containing  $90^\circ$ ) or a Quarter of a Circle, as you will more plainly see hereafter. Thus the two Lines meeting in the Point A form a *right Angle*. Fig. 4.

A 

5. An *acute Angle* is when two Lines meet closer or nearer together than a right Angle, and is less than  $90^\circ$  or the Quarter of a Circle: An *acute Angle* is well represented by a Pair of Compasses opened a little way at Random, as Fig. 5.

Fig. 5.

 B



6. An *obtuse Angle* is when two Lines are extended wider than a right Angle, and contains more than  $90^\circ$  or a Quarter of a Circle, and may be represented by a Pair of Compasses extended very wide, as C, Fig. 6.

Fig. 6.



7. A *Triangle* is made by the meeting together of three Lines in three Points, as Fig. 7, 8, 9, 10, and 11.

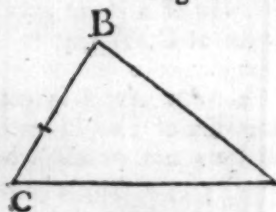
Fig. 7.



TYRO. Have not these *Triangles* different Names, as the *Angles* before had?

8. PHILO. Yes, the *Triangles* take their Names from the different *Angles* they are formed from: Thus the *Triangle* ABC, (Fig. 7.) is a right angled *Triangle*, because it has one right *Angle* at A.

Fig. 8.



9. An *equilateral Triangle* has all its Sides equal, and all its *Angles* acute, as CDE, Fig. 9.

Fig. 9.



10. An *isosceles*, or *equicrural Triangle* has two Sides equal, and every *Angle* acute, as EFG, Fig. 10.

Fig. 10.



11. A

Fig. 11.

11. A *scalenous* Triangle has one Angle always obtuse, and therefore is called an *obtuse* angled Triangle, whose Angle D is obtuse. See Fig. 11.

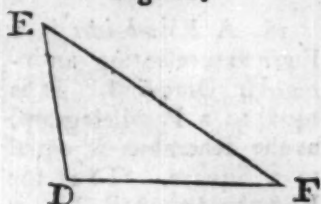


Fig. 12.

12. A *Square* is a regular Geometrical Figure, formed by a right Line of any Length, (supposing AB) passing down, or thro' the Space ABCD, as Fig. 12.

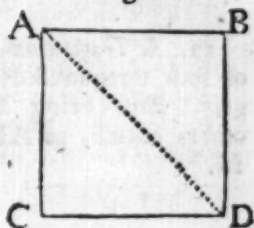


Fig. 13.

13. A *Parallelogram* (vulgarly called a long Square) is an oblong Figure whose Sides are regular and parallel, as *abcd*.

14. A *Diagonal* (called also the Hypothenufe) is that Line which runs crofs the Figure from Corner to Corner. Thus the Line AD, Fig. 12, and *ad*, Fig. 13, are Diagonals.

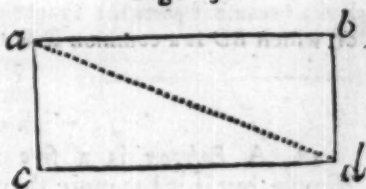
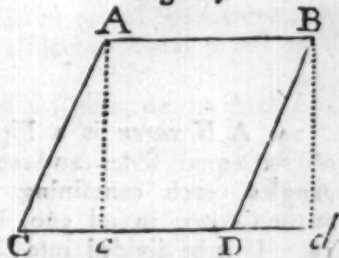


Fig. 14.

15. A *Rhombus* is a Diamond-like Figure, having all its Sides equal; it has two Angles obtuse, as A and D, and two acute, as B and C, Fig. 14.



*Note*, A *Rhombus* is only a Square put out of its natural Order, for the *Rhombus* ABCD is equal to the Square ABcd, as is evident by the very Sight of Fig. 14.

Fig. 15.

16. A *Rhomboides* is a Figure representing an irregular Diamond. It is equal to a Parallelogram, as the Rhombus is equal to a Square. Thus the Rhomboides ABCD is equal to the Parallelogram ABcd.

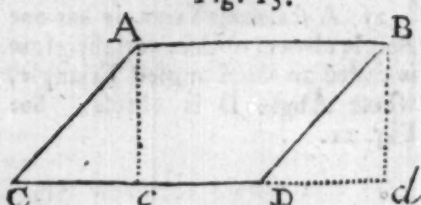
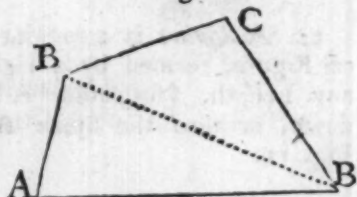


Fig. 16.

17. A *Trapezium* is a Figure of four unequal Sides and Angles, some being acute, and others obtuse, as ABCD, Fig. 16.



N. B. The Diagonal BD in this Figure is most commonly called the Base, because it parts the Trapezium, and makes thereof two Triangles, of which BD is a common Base to both.

Fig. 17.

18. A *Polygon* is a five sided Figure, but if it has more than five Sides (provided they be unequal) it is still called a *Polygon*, as ABCDE, Fig. 17.

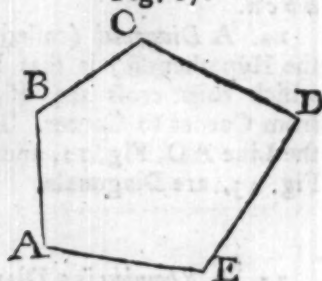


Fig. 18.

19. A *Hexagon* is a Figure of six equal Sides and equal Angles, each containing  $60^\circ$  at the Center, in all  $360^\circ$ , Fig. 18. If it be divided into Triangles, it will contain six equilateral Triangles, all equal, of which DGC is one, equal and similar to CDE, in Fig. 9.

N. B. From the bare Inspection of this Figure, you may form a very just Idea of all that are here subjoined by Name only, and may very easily draw any one of them; and by the Table tell the Angles and Area of each.

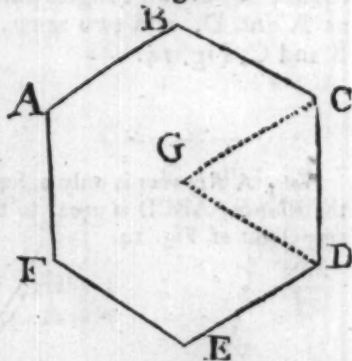


TABLE.

T A B L E.

Names of the Figures.	No. of Sides.	Angles at the Center.	Angles at the Circumference.	Areas, the Square being one Inch.
A Square,	4	90.	90.	1.0000
A Pentagon,	5	72.	108.	1.7204
An Hexagon,	6	60.	120.	2.598
An Heptagon,	7	51.4285	128.5714	3.6339
An Octagon,	8	45.	135.	4.8284
A Nonagon,	9	40.	140.	6.1818
A Decagon,	10	36.	144.	7.6942
An Undecagon,	11	32.72	147.27	9.3656
A Dodecagon,	12	30.	150.	11.197

Fig. 19.



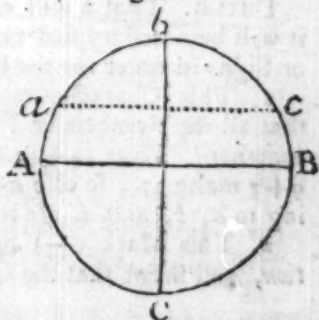
20. A *Circle* is a perfect round Figure, made from the Motion or Rotation of the Line *Ad* moving upon the Point *A*, from *d* towards *e*, and continuing its Motion round to *b* and *c* till it arrives again to *d*, Fig. 19.

21. The *Diameter* is that Line which parts the Circle into two equal Parts, (or Semi-circles) as the Line *bAd*; and the *Radius* of a Circle is always half the Semi diameter, or is that Line which forms the whole Circle round the Center; thus *Ab*, *Ac*, *Ad*, *Ae*, are all or either of them equal to the *Radius*.

22. A *Quadrant* is a Quarter of a Circle, as the Arch *b* or *c*, *cd*, Fig. 19.

23. A *Sector* is Part of a Circle more or less than a Quadrant, as the Arch *be*, or *de*, Fig. 19.

Fig. 20.



24. A *Chord Line* is that which runs from any Part of the Verge of the Circle (called the *Periphery*) to the opposite Part; thus the Line *ac* is the *Chord* to the Arch *abc*, or the great Arch *aCc*, Fig. 20.

25. A *Segment* of a Circle is a Part cut off by a *Chord* or Line; thus *abc* is the less *Segment*, and *aCc* is the greater *Segment* of the Circle *AbBC*, Fig. 2.



Fig. 21.

26. A *Tangent* is a Line that runs perpendicular to the Diameter, and meets it just at the Verge or *Periphery* of the Circle; thus the Line  $Ca$  is a *Tangent* to the Arch  $BC$ ; also  $Cb$ ,  $Cc$ , and  $Cd$ , are *Tangents* to their respective Arches, Fig. 21.

27. A *Secant* is a Line drawn from the Center of the Circle through the *Periphery* (or Verge) till it meets with the *Tangent*. Thus the Line  $ABa$ , is the *Secant* to the *Tangent*  $Ca$  and Arch  $BC$ : So also  $Ab$ ,  $Ac$ , and  $Ad$  are *Secants* to the *Tangents* that meet them, Fig. 21.

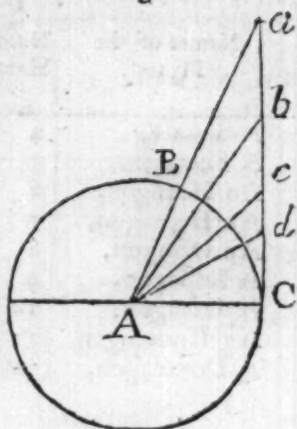
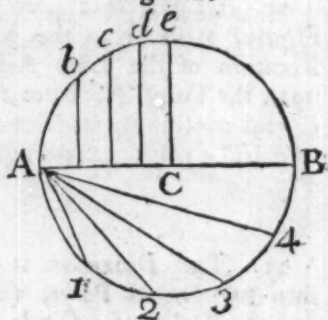


Fig. 22.

26. The natural Sine or Sines of any Arch or Arches, are Lines drawn perpendicular to the Diameter of the Circle: Thus the Line  $Ce$ , is the right Sine of  $CB$ , so also the Lines  $bc$  and  $d$ , are Sines of their respective Arches; and the Lines  $A1$ ,  $A2$ ,  $A3$ , and  $A4$ , are called *Chord Lines* to their respective Arches,  $A1$ ,  $A2$ ,  $A3$ ,  $A4$ , &c.



### S E C T. III.

*Concerning something more of the Nature of a Circle, with the Sine, Sine Complement, and versed Sine of an Arch.*

TYRO. What do you mean by a Sine, Sine Complement, &c. of an Arch?

PHILO. That I will explain to you in a few Minutes; but it will be necessary first that you understand some certain Marks or Signs in order for the better understanding this Work.

1. This Character or Mark (+) signifies *more*, and shews that all the Numbers or Things before and after it are to be added together: Thus  $14+12$  added together make 26, and  $6+5+9+7$  make 27; so also  $a+b+d$  shews that the Numbers belonging to  $a$ ,  $b$ , and  $d$ , are to be added together.

2. This Mark (—) signifies *less*, and is the Sign of *Subtraction*, and shews that the Quantity or Number after it is to be subtracted

tracted out of the Quantity or Number before it: Thus  $24 - 15$ , is 24 less 15, or shews that 15 is to be taken out of 24, &c.

3. This Mark ( $\times$ ) is the Sign of *Multiplication*, and shews that all the Numbers before and after it are to be continually multiplied: Thus  $5 \times 14$  makes 70; and  $5 \times 7 \times 8$  make 280.

4. This Mark ( $\div$ ) is the Sign of *Division*, and shews the Number before it is to be divided by the Number after it: Thus  $48 \div$  by 6 is 8, and  $84 \div 7$  is 12.

5. This Mark ( $=$ ) is the Sign of *Equality*, and shews that all the Numbers or Quantities before it are equal to those after it: Thus  $4 + 7 = 11$ ; that is, 4 and 7 are equal to 11: Also  $19 - 7 = 12$  is 19 less 7 equal to 12.

6. Two Dots one over the other thus ( $:$ ) signifies the Word *to*.

7. Four Dots thus ( $::$ ) signify *so is*; and when they are put together they are the Sign of Proportion or Rule of Three Direct. For suppose 2, 4, 4, and 8 had these Marks thus,  $2::4:4:8$ , they are thus read, as 2 to 4, so is 4 to 8. Or,  $a:b::b:d$ , is thus read, as  $a$  to  $b$ , so is  $b$  to  $d$ .

8. This Character ( $^{\circ}$ ) signifies or stands for *Degrees*, and this ( $'$ ) for *Minutes* or *Miles*.

9. This Mark ( $\sphericalangle$ ) signifies an *Angle*, this ( $\sphericalangle$ s) *Angles*.

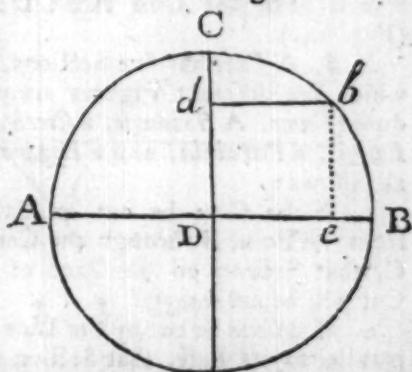
10. This ( $\triangle$ ) a *Triangle*, this ( $\triangle$ s) for *Triangles*.

11. This ( $\square$ ) stands for a *Square*.

12. This ( $\square$ ) for a *Rectangle* or *Parallelogram*.

TYRO. I shall endeavour to make myself Master of these Characters or Signs forthwith.

Fig. 1.




PHILO. Observe then what follows, first, the *right* or *natural* Sine of an Arch is a Line drawn from any Part of a Circle perpendicular to the Diameter: Thus, suppose the Quadrant (or Quarter of the Circle) DCB to be divided into two Parts, viz.  $Bb = 42^{\circ}$ , and  $Cb = 48^{\circ}$ ; then from  $b$  draw the perpendicular Line  $cb$ ; so is  $eb$  the Sine of  $42^{\circ}$  to the Arch  $Bb$ ; and  $bd$  the Sign of  $48^{\circ}$ .

2. The *Complement* of an Arch is the Remainder of any Arch to  $90^{\circ}$ . Thus the *Complement* of the Arch  $Bb = 42$ , is the Arch  $bC = 48$ .

3. The *Cofine* or *Sine Complement* of an Arch is the Sine of the *Complement* of that Arch: Thus (as was said before) the Sine

*Sine* of the Arch  $Bb$  is  $eb$ ; and the *Cofine* or *Sine Complement* to a Quadrant, is the Line  $db$ , the *Sine* to the Arch  $Cb$ .

4. The *versed Sine* is that Line, or Part of the Diameter which extends from the Periphery of the Circle to the Point where the right *Sine* falls upon the Diameter: Thus the Line  $Be$  is the *versed Sine* of the Arch  $Bb$ , and  $Cd$  is the *versed Sine* of the Arch  $Cb$ .

5.  Always remember this, that the *versed Sine* and *Cofine* (or *Sine Complement*) of an Arch are always equal to the Radius or Semi-Diameter: Thus the *versed Sine*  $Be$  and the *Cofine*  $db$ , ( $=$  to  $De$ ) are equal to  $DB$  the Radius; for  $db = De$  by Inspection; and  $Be + De = DB$ , the Radius itself.

TYRO. I thank you, Sir; but before you leave this Section pray give me some Account of the Nature and Property of a *Cone*?

PHILO. I am ready to answer any Thing that lies in my Power: But a *Cone* being a solid Body, it is at present a little foreign to our Purpose; however, as it may be of some Service to you, observe well the following Definition of a *Cone*, both as to its make and Generation, as well as to its Properties.

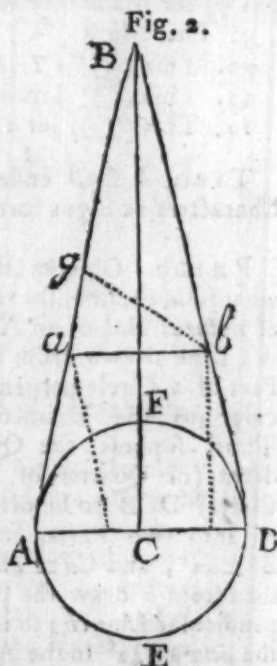
1. A *Cone* is made or generated thus, suppose a String was fastened at the Point  $B$ , and extended to the Periphery of the Circle either at  $A$  or  $D$ ; I say, by taking the String in your Hand and moving it gently round the Circle (or Hoop)  $AFDE$ , it will form the *Cone*  $ABCDEF$ , (Fig. 24.)

N. B. A *Cone* has five Sections, by which five different Figures are produced, *viz.* A *Triangle*, a *Circle*, an *Ellipsis*, a *Parabola*, and a *Hyperbola*, as follows:

1. If the *Cone* be cut in Halves from the Point  $B$  through the Center  $C$ , that Section on the Face of the Cut will be a *Triangle*.

2. If a *Cone* be cut by the Line  $ab$ , parallel to its Base, that Section will form a true *Circle*.

3. If a *Cone* be cut by a Line parallel to its Axis, (*viz.* by the Line  $bc$ ) that Section will form an *Hyperbola*.



4. If a *Cone* be cut by a Line parallel to one of its Sides (as the Line *aC* parallel to *bD*) that Section will form a *Parabola*.

5. If a *Cone* be cut obliquely, or athwart, from Side to Side, (as by the Line *bg*) that Section will form an *Ellipsis*. But this you will see more of hereafter.

# S E C T. IV.

## Geometrical Theorems.

TYRO. I thank you, Sir, for these Instructions; be pleased to shew me something more concerning the Nature of *Angles*, *Circles*, &c.

PHILO. I will.—You remember I told you all *Angles* are Part of a *Circle*, and contain some certain Degrees of an Arch thereof, to measure which is called *Trigonometry*, as you will see by and by under that Head. Previous to this you are to observe,

Fig. 1.

1. If a Circle be cut by two right Lines, as *AB* and *CD*, I say that the Circle will be cut into four Parts or Angles, the opposite of which are equal, viz.  $a = a$  and  $b = b$ ; also the obtuse or greater Angle *a*, with the acute Angle *b*, will both together be = to a Semi-Circle.

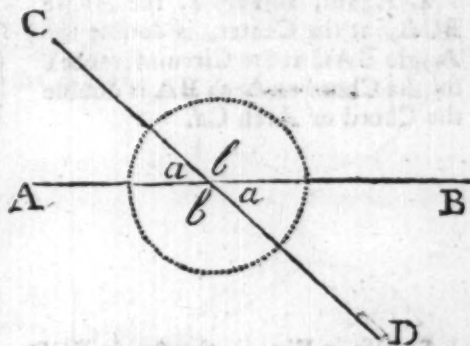
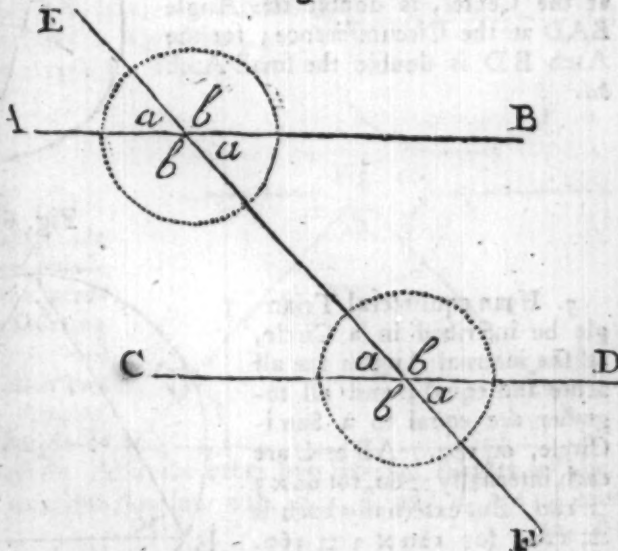


Fig. 2.

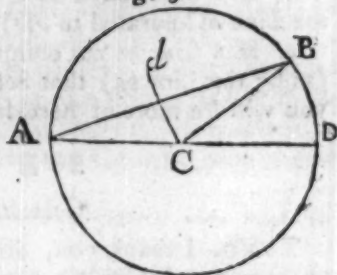
2. If two Circles be cut in the Center of each, by two Parallel Lines, then the Angles of one will be equal to the Angles of the other: Thus, *a, a, a, a*, and *b, b, b, b*, are equal to each other.





3. An Angle at the Center is double an Angle at the Circumference, as appears by the three following Figures: For in Fig. 3. the Angle BCD at the Center is double the Angle BAD, or ABC at the Circumference; for the Arch BD is double the Arch Cd, as may be proved by a Pair of Dividers, for take off the Distance Cd, and setting one Foot of the Compasses in D, it will be just half the Extent or Distance of the Arch DB.

Fig. 3.



4. Again, In Fig. 4. the Angle BCA, at the Center, is double the Angle BAC at the Circumference; for the Chord or Arch BA is double the Chord or Arch Cd.

Fig. 4.

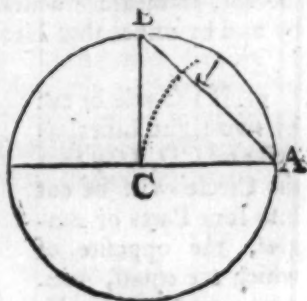


Fig. 5.

So also in Fig. 5. the Angle BCD, at the Center, is double the Angle BAD at the Circumference; for the Arch BD is double the small Arch bd.



Fig. 6.

5. If an equilateral Triangle be inscribed in a Circle, all the internal Angles are all acute and equal; and all together are equal to a Semi-Circle, or 180. AB or C are each internally = 60, for  $60 \times 3 = 180$ . But externally each is = 120, for  $120 \times 3 = 360$ . Fig. 6.

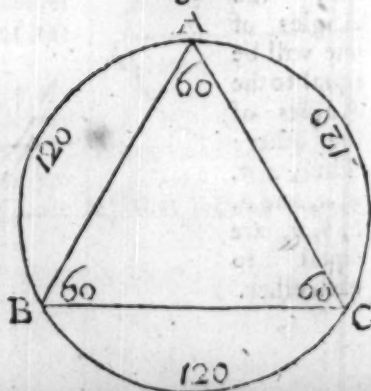


Fig. 7.

6. Every Angle drawn in a Semi-Circle, or whose Legs extend exact the Width of the Diameter of a Circle, will be a right Angle, viz.  $=$  a Quadrant or  $90^\circ$ , as the Angle A, Fig. 7.

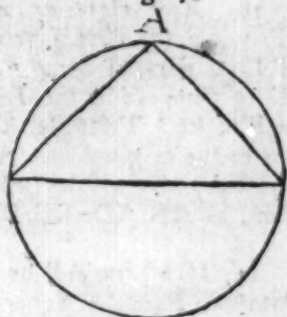


Fig. 8.

7. An Angle in an Arch greater than a Semi-Circle, whose Legs take up more than an Arch contained in a Semi-Circle, (as Bdc) will be an acute Angle, or less than a Quadrant or  $90^\circ$ , as the Angle B, Fig. 8.

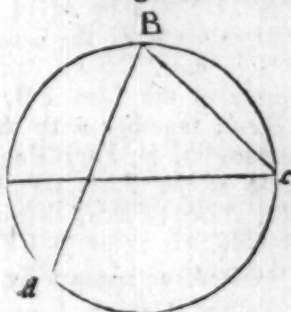


Fig. 9.

8. An Angle in an Arch less than a Semi-Circle, whose Legs take up less Space than a Semi-Circle, (as Cbd) will be an obtuse Angle, greater than a Quadrant, or  $90^\circ$ , as the Angle C, Fig. 9.

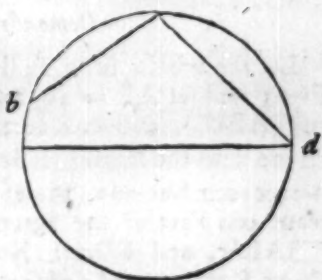


Fig. 10.

9. Any right-lined Triangle, made between two parallel Lines, the internal Angle meeting in the Point A, will be  $=$ , the other two external Angles, viz. the Angle at



A is  $=$  a and b: Also the other two internal Angles will be  $=$  to the said external Angles, viz. a, c, b, and d, are all equal, Fig. 10.

10. Any

Fig. 11.

10. Any right or equi-angled Triangle (as ABC) being cut by a Line parallel to any one of its Sides (suppose by the Line DE) it will make a Triangle ADE, similar to the original one ABC, and the Sides also will be in Proportion. For, as  $AB:AD::BC:DE$ , or as  $AB:AD::AC:AE$ .

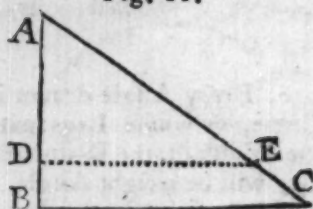
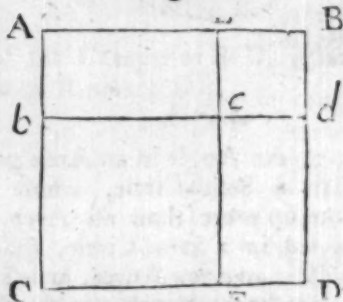


Fig. 12.

11. If a Line AB be divided into two Parts, a Square made of the whole Line AB (*viz.* ABCD) will be equal to the Squares made of the Line AE, or *b c*, *viz.* CFbc, and the Square of the Line EB, *viz.* EBcd; together with the two Rectangles, or Parallelograms, made of the Parts themselves, *viz.* AEbc+FDcd, that is, the  $\square ABCD$  is = to  $\square CFbc$  + the  $\square EBcd$  + the  $\square AEbc$  + the  $\square FDcd$ , as appears by Fig. 12.



TYRO. I think I understand you, but however if you can further explain it to me I shall be thankful.

PHILO. I will demonstrate it then by common Arithmetic.

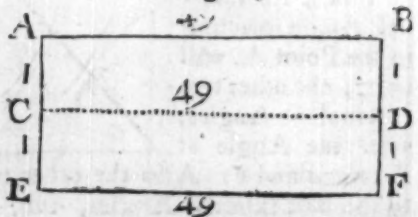
*Demonstration of Fig. 12.*

Let the whole Line AB, in the foregoing Figure, be = 30 Feet; and let AE be 20, and AB 10 Feet. Now  $30 \times 30 = 900 = \square ABCD$ , and  $20 \times 20 = 400 =$  to the  $\square CFbc$ ; and  $10 \times 10 = 100 =$  to the small  $\square EBcd$ . Now  $30 \times 30 = 900$ ; but  $20 \times 20 + 10 \times 10 =$  but 500, therefore the Squares made of the Parts want 400 Feet of the Square made of the whole, *viz.* the two  $\square AEbc$ , and  $\square FDcd$ : Now by the Figure  $cd = 10$  and AE, Cb or Fc = 20, and  $20 \times 10 = 200$  one of the  $\square$ s, + 200 = 400, both the Rectangles or  $\square$ s, which were wanting in the Square itself to make up 900 Feet, does this appear plain to you?

TYRO. Sir, I understand it clearly.

Fig. 13.

12. If any Parallelogram have Unity (or 1) at the Ends; if the Ends be increased by Unity (or 1) that Parallelogram will be double the Area of the first. Thus, let the Line AB =



49 =

49 = CD 49, and let the Ends of the Parallelogram be encreased as wide again; that is, suppose the Line CD was continued down, or to fall as low as EF, Unity or 1 further; then I say that the Parallelogram ABEF is double ABCD, viz. = ABCD + CDEF. From a due Consideration of the Figure it will be easy to solve all such critical Questions of this Sort, as are too often started in Company by a set of Ignoramuses, who often put Persons of far more superior Knowledge to the blush. An Example is as follows:

If 100 Hurdles or Pens will fold, or keep 100 Sheep, how many will fold or keep 200? Can you do it, TYRO?

TYRO. Yes, surely, it is only a Rule of Three Sum, and I state it thus, If 100 be 100, what will 200 be? Ans. 200.

PHILO. You make me laugh, TYRO, for it is very evident that 102 Hurdles will fold 200 Sheep.

TYRO. How can that be?

PHILO. Only consider the Nature of the Figure itself, and you will soon see it. First I set down 49 Hurdles from A to B, and 49 more from C to D, which is in all 98 Hurdles, then I set one at each End, viz. from A to C, and from B to D, which makes 100 Hurdles in all, and the Parallelogram ABCD will fold 100 Sheep; now remove the 49 Hurdles from CD down to EF, and it is plain the Parallelogram is just as big again; then I place 2 more Hurdles, viz. from C to E, and from D to F, and the whole is completed, which shews that 2 Hurdles more will fold 200 Sheep.

TYRO. Sir, I see it very evidently; and now I should be obliged to you to shew me something more of the Nature of a right angled Triangle, and the Proportion the Sides bear to each other.

PHILO. I will.

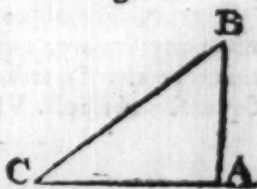
## S E C T. V.

*Concerning the Nature of a right angled Triangle, and the Relation one Side bears to another, and its great Use and Utility in several Mathematical Operations.*

TYRO. Have you any particular Names for the different Sides of a Triangle?

PHILO. Yes, three; for that Side which lies next your Breast, or fronting you, (viz. the Line CA) is called the *Base*; the Side upon which it is raised, or that stands upright to the *Base* (as the Line AB) is called the *Cathetus*, or *Perpendicular*; and the slant or longest Side (as the Line CB) is called the *Hypothenuse*, or *Diagonal Line*.

Fig. 1.



Q

TYRO.



TYRO. I understand you well. But pray what Proportion have the Sides, and the Squares of the Sides to each other.

PHILO. The Sides and the Proportion to each other are found by the Square Root; but any two Sides being given, and the third Side required, the Relation of the Squares to each other is easily known by the following Rules.

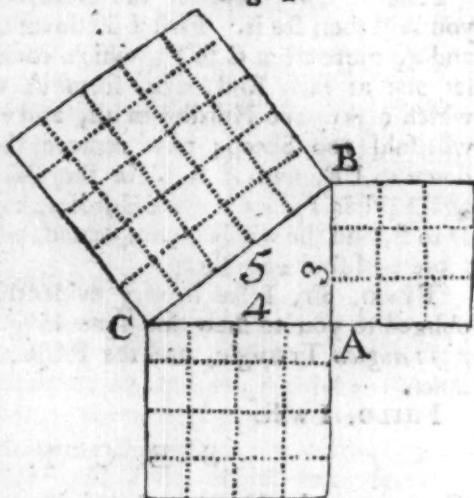
1. The Square of the Base and *Perpendicular* will be always equal to the Square of the *Hypotenuse*.

2. The Square of the *Perpendicular* taken out of the Square of the *Hypotenuse*, there will remain the Square of the Base. Or,

3. The Square of the Base, taken from the Square of the *Hypotenuse*, leaves the Square of the *Perpendicular*.

TYRO. I understand the Rules, and they appear very clear, but I should be glad if you would give me a further Demonstration by some Draught or Figure.

Fig. 2.



PHILO. I will TYRO. — Observe then. In the Triangle ABC (as before) let the *Perpendicular* AB be equal to three, Inches Feet, Yards, or any Thing; suppose also the Base AC=4; then will the *Hypotenuse* CB be=5. Fig. 2.

Proof.

1. The Square of 3=9 as you see by the little Squares in the *Perpendicular*; and the Square of 4 = 16

Squares in the *Base*: Now  $9+16=25$  the Squares in the *Hypotenuse*.

2. Again,  $25-16=9$ , the Square of *Perpendicular*. And,

3. From 25 take 9, there remains 16, the Square of the *Base*. Does this appear plain?

TYRO. I understand it perfectly.

PHILO. From hence then you will easily discover how to augment any Square, and how much must be added to any Side to make another Square double, triple, or quadruple, to the given Square. See Sect. VI. Prob.V.

S E C T. VI.

*Of Geometrical Problems.*

TYRO. I think I shall like to make Use of my Case of Instruments

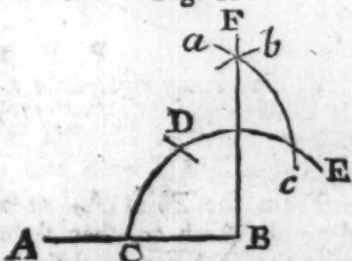
PHILO. I am glad you think you shall like to work *Problems*, for they are diverting as well as useful; and if you mind the Words themselves, and proceed from Step to Step, you cannot mis-understand any one of them.

P R O B. I.

*To raise a Perpendicular on the End of a Line.*

First, open the Compasses at any Distance shorter than the Line itself, and setting one Foot in B describe the Arch CDE, then setting one Foot in D describe the Arch *ac*, and with the same Distance setting one Foot in *c* describe or cross *ac* in *b*, then from this Intersection and thro' the Point B draw the Line FB, and it shall be a true Perpendicular required.

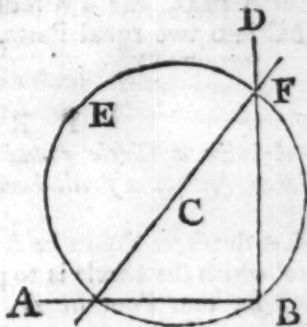
Fig. 1.



*Another Way.*

Having drawn the Line AB, place one Foot of your Compasses any where, (supposing at C) and describe the Circle AEFB to pass thro' the Point B; this done lay a Ruler from A to C, and draw the Line ACF; then draw the Line BD thro' the Point F and it shall be a true Perpendicular required.

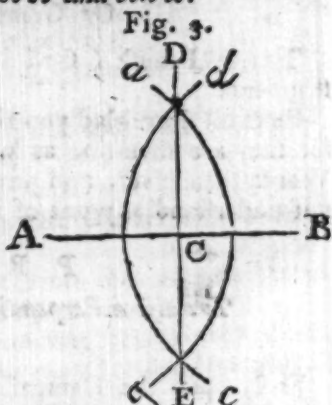
Fig. 2.



## P R O B. II.

*To divide a Line into two equal Parts, which shall be a Perpendicular to the Line both above and below.*

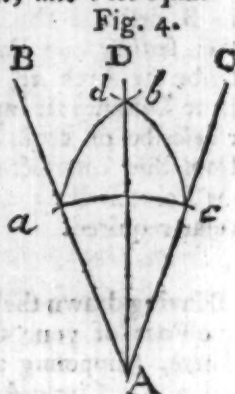
Open the Compasses to any Distance more than half the Line AB, and setting one Foot in A, describe the Arch *ab*; then with the same Distance setting one Foot in B describe the Arch *cd* to intersect *ab*; then thro' these Intersections draw the Line DCE, and it will divide the Line into two equal Parts in C and CD, and CE will be the two Perpendiculars required.



## P R O B. III.

*To divide any right-lin'd Angle, or Triangle, into two equal Parts.*

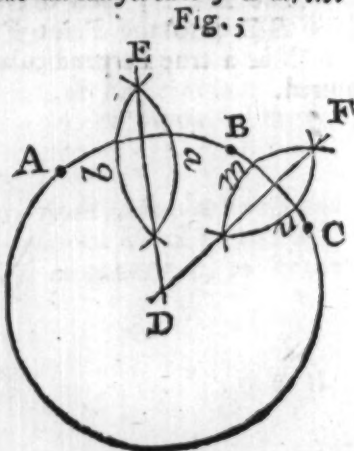
From the Point A, at any Distance, draw the Arch *ac*, then set one Foot in *a*, with the Distance *ac* describe the Arch *dc*, and with the same opening of the Compasses set one Foot in *c*, and describe *ab*; lastly, thro' this Intersection draw a strait Line from A to D, and it will divide the Angle ABC into two equal Parts.



## P R O B. IV.

*To describe a Circle round any Triangle, or to bring any three Points (not in a strait Line) into the Circumference of a Circle.*

Let the three Points be ABC, thro' which the Circle is to pass. First set one Foot in A, and with any Distance more than half AB describe the Arch *a*; with the same opening one Foot being in B describe the Arch *b* to cross or intersect *a*; then setting one Foot in C with more than half the Distance CB describe the Arch *m*, and with the same opening, one Foot being in B describe the Arch *n*; then thro' the Intersection of these



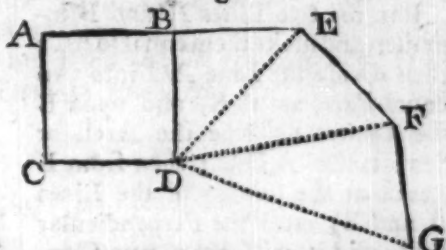
Arches draw the two strait Lines DE and DF, which will cross or intersect each other in D, and the Point D will be the Center, from which you may describe a Circle that will pass thro' the given Points ABC.

P R O B. V.

To augment or increase a Square, or to find a Line whose Square shall be double, triple, or quadruple, the given Square.

Fig. 6.

Let the given Square be ABCD. First set off the Distance AB from B to E, and draw DE, so shall the  $\square$  of DE be = the Double. Then set the same Distance (viz. AB, or BE) from



E to F, and perpendicular or at right Angles with DE, and draw the Line DF, I say the  $\square$  of DF will be triple the  $\square$  of AB: Again, make FG = AB and draw it perpendicular to DF, then draw DG and it shall be a Line or Side of a  $\square$  quadruple to the  $\square$  ABCD, and thus you may go on encreasing the Square at Pleasure.

P R O B. VI.

Having the Sides of two, three, or more Squares to make the Side of a Square equal to all their Squares.

Let there be four Lines ABCD, it is required to make a Line whose Squares shall be equal to the Squares of the given Lines added together.

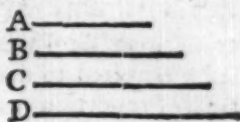
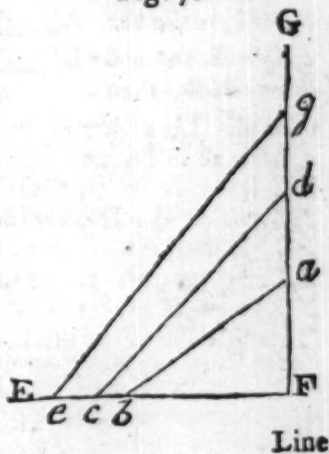


Fig. 7.

First draw the Line EF and raise the Perpendicular FG, then take the shortest Line A in your Dividers, and setting one Foot in F set from F to a, and the Line B from F to b, and then draw ab, whose Square shall be = the Squares of the two Lines A and B. Then set ab from F to d, and the Line C from F to c, and draw cd, whose  $\square$  is = to the Square of the three Lines ABC. Lastly, set cd from F to g, and the Line D from F to e, and draw eg; so shall the last





Line  $eg$  be the Side of a  $\square$ , equal to the Squares of all the given Lines  $ABCD$ .

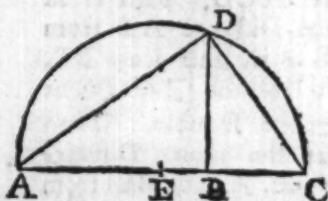
## P R O B. VII.

To find a Line which shall be a true Geometrical mean Proportion between any two given Lines.

Let the two Lines be  $A$  and  $B$ , (of any Length)  $A$  ———  $B$  ———  
it is required to find a mean Proportional.

Fig. 8.

Join the two Lines  $A$  and  $B$  together, and make them equal to  $AC$ ; then divide the Line  $AC$  into two equal Parts as at  $E$ , and upon  $E$  the Center describe the Arch or Semi-circle  $ADC$ ; then from  $B$  (*viz.* at the joining of the Lines  $A$  and  $B$ ) erect the Perpendicular  $BD$ , and it will be a true Geometrical Line between the Lines  $A$  and  $B$ .



Thus suppose  $AC = 50$ ,  $A = AB = 34$ , and  $B = BC = 16$ ; then will  $BD$  be  $= 23.3$  Parts, which is a mean between 34 and 16. For multiply 34 by 16 and extract the Square Root, you will have the true mean 23.3.

## P R O B. VIII.

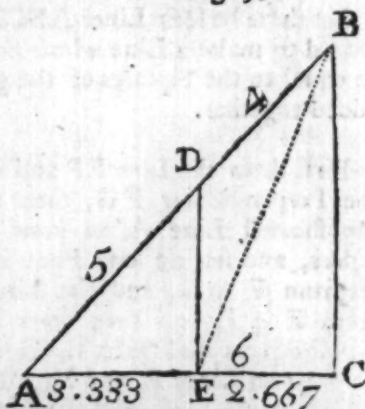
To divide a right Line into any proportionable Parts.

Fig. 9.

Let the Line  $AC$  be equal to six Feet or Inches, and let it be required to divide it into such Proportion as  $A$  to  $B$ , *viz.* as 5 to 4.

First, make the  $A$  ——— 5  
Angle  $BAC$  and  $B$  ——— 4  
draw  $AB$ , then

take the Line  $A = 5$ , and set it from  $A$  to  $D$ , and the Line  $B$ , from  $D$  to  $B$ , and draw  $AB$ , draw also  $DE$  parallel to  $BC$ , so shall  $AC$  be  $= 6$ , *viz.*  $AE = 3.333$ , and  $EC = 2.667$ , and by drawing the prick'd Line  $EB$  you will have the Triangle  $ABC$  also in Proportion to the Triangle  $EBC$ , as the Lines are, *viz.* as 5 to 4.



*Arithmetically.*

Add the two Lines together thus,  $5+4=9$ ; then, as  $9:6::5:3.333$ , the greatest Part of AC; and  $6-3.333=2.667=EC$ , the less Part.

From a due Consideration of this Law of Proportion will follow this Practical Question.

Two Grasers, A and B, had a Field in the Form of the Triangle CDE, at one Side of which is a Pond of Water (at G) for the Cattle to drink: But the Grasers fell out, and 'twas agreed to divide the Ground into two equal Parts, it is required to know in what Manner the Field ought to be divided so as each shall have an equal Share of the Grass and Water. See next Problem \*:

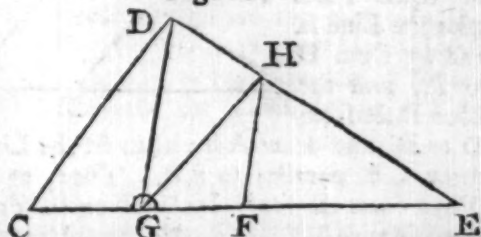
P R O B. IX.

*To divide a Triangle into two equal Parts.*

Fig. 10.

Let the Triangle be CDE, to be divided into two equal Parts from the Point G (which represents a Pond, by the Question in Prob. VIII.).

First draw the Line from D to the Center, or Point at G, then divide CE into two equal Parts at F, and draw FH parallel to GD, then draw the Line GH, so is the Triangle divided into two equal Parts: For CDE and GHE being similar Figures, CDHG is = GHE.



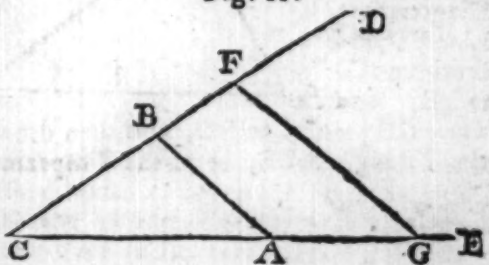
P R O B. X.

*Any two Numbers or Lines given to find a third Line or Number in Proportion.*

Let the two Lines be A and B, to find a  $\frac{A}{B}$  third in Proportion.

Fig. 11.

First draw the strait Line CE, (to any assigned Length) then draw at Random the Line CD, making therewith any Angle at Pleasure; then take the shorter Line B, and set it from C to



B, and

\* See the foregoing Question,

B, and the Line A from C to A; then take CA in your Compasses, and set it from C to F, and draw FG parallel to BA and it is done. For, as  $CB:CA::CF$  (or CA) :CG. Or, as  $CB:BA::CF$  (or CA) :FG, &c.

## P R O B. XI.

*Three Lines or Numbers given to find a fourth, fifth, or sixth, &c. in Proportion.*

Let the three Lines be A B C to find a A \_\_\_\_\_  
fourth, fifth, &c. in Proportion. B \_\_\_\_\_

First draw the Horizontal or strait C \_\_\_\_\_  
Line DM, and Fig. 12.

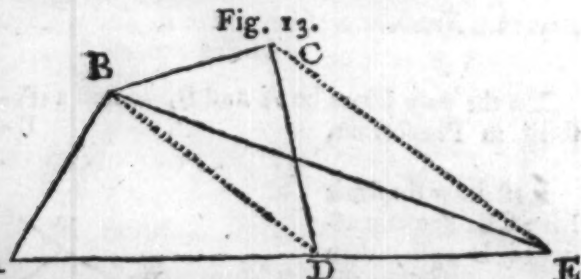
make the Angle LDM at Pleasure; then from any Scale of equal Parts take the Line A and set from D to A, and the Line B set from D to B, and draw AB; then set the Line C from D to C, and draw CE parallel to AB. Then, as  $DA:DB::DC:DE$ , &c. Then from the same Scale of equal Parts set off (at Pleasure) the Distance DF, DG, &c. and draw FH parallel to CE, and GK parallel to FH, and 'tis done: For, as  $DA:DB::DF:DH$ ; or, as  $DA:AB::DG:GK$ , &c. &c.

## P R O B. XII.

*To reduce a Trapezium to a Triangle.*

Let the Trapezium be ABCD. First draw the Diagonal Line BD, and continue AD to E, and A

draw CE parallel to BD, and then draw the Line BE, so shall the Triangle ABE, be = the Trapezium ABCD.



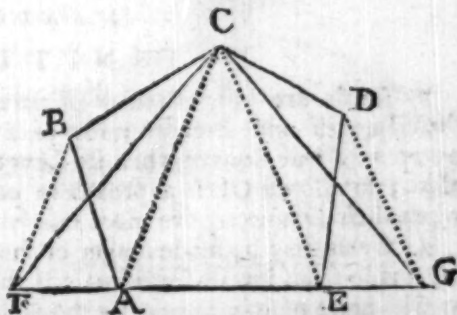
P R O B.

P R O B. XIII.

*To reduce an irregular Figure (or Polygon) of five Sides into a Triangle.*

Fig. 14.

Let the Polygon be ABCDE. First with a strait Ruler continue the Side AE to F and G at Pleasure; then draw the prick'd Lines CA and CE, then draw DG parallel to CE, and BF parallel to CA, and lastly, from the Point C draw the Line CF



and CG; so shall the Triangle CFG be = the Polygon ABCDE.

N. B. By the same Rule you may reduce any irregular sided Figure to a Square or a Triangle, which is of great Use in Land-measuring; the Triangle being always equal to half a Square, of the same Height and Length of the Triangle, as you will more fully see hereafter.

P R O B. XIV.

*To draw a Helix or Spiral Line (vulgarly called a Scrole) with a Pair of Compasses.*

Fig. 15.

Let there be two given Points, A and B, in order to describe the Spiral Line BCDEF. First draw CE thro' the Points AB, then set one Foot of the Compasses in A, and extend the other to the Point B, and describe the small Semi-circle Bc; then setting one Foot of the Compasses in B, extend the other Foot to join the first Semi-circle



in c, and sweep the Arch or Semi-circle cd; then place one Foot in A and extend the other to d, sweep the Arch de; then place the Compasses in B and extend the other to e, and sweep the Arch ef; then set one Foot in A, and extending the other to f sweep the Semi-circle fg; then again, one Foot in B with the Distance Bg, describe the Semi-circle gb; and thus go on making



making one Semi-circle above to join the other below, and you will describe the Figure here annexed, which is very useful in several Things that require to be carved in Wood, &c.

## P R O B. XV.

*To describe or draw Ovals.*

## D E F I N I T I O N.

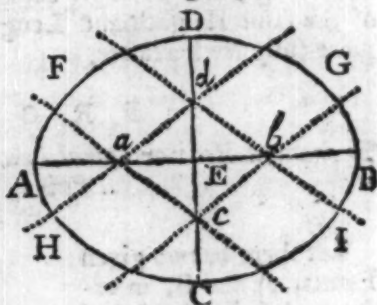
1. Ovals are long circular Figures, and vary according to their Length and Breadth; for as a Parallelogram approaches nearer to a true Square when its Length and Breadth are nearest alike; so also do Ovals approach to or are more like to Circles, when their Diameters are more nearly alike. Therefore,

2. Ovals may be made longer or shorter at Pleasure, some being made from Parallelograms and others from inscribed Circles, as will more plainly appear by the following Operation.

*Two Lines, AB and CD, given, to make thereof an Oval.*

Fig. 19.

Let AB be the transverse, and CD the conjugate Diameter. First draw DC and AB to intersect each other in the Middle at E; then divide the Diameters AB and CD into four equal Parts at the Points AabB and CcdD; then draw the Parallel Lines *db* and *ac*, and after that the other two parallel Lines *ad* and *cb* thro' the Points



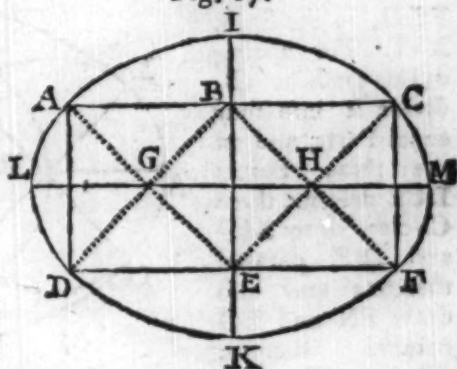
*a, b, c, d*; then take the Distance *Dc* in your Compasses, and setting one Foot in *c* describe the Arch *FDC*; with that same Extent placing one Foot in *d*, describe the Arch *HCI*: This done set one Foot in *a*, and with the Distance *aH* or *aF* describe the Arch *HAF*; and with the same Extent placing one Foot in *b*, describe *b* the Arch *GBI*, and the Oval will be completed.

P R O B. XVI.

*To draw an Oval by help of a Parallelogram or two Geometrical Squares.*

Fig. 17.

First draw the Lines AC, and make  $CF=CB$ , which will be half the Line AC; then draw DF parallel to AC; draw also AD and BE, and you will have two Squares ABDE, and B C E F; then draw the diagonal Lines AE and BF, and opening the Compasses with the Extent of AE or CE, place one Foot in E, and draw the Arch AC; then with the same Extent one Foot placed in B describes the Arch DF; then set one Foot in G, and with the Distance GA sweep the Arch DA, and with the same Extent from H sweep the Arch CF, and so is the Oval LIMK completed; and is allowed to be the neatest Oval of any Sort, and is vulgarly called the Egg Oval.



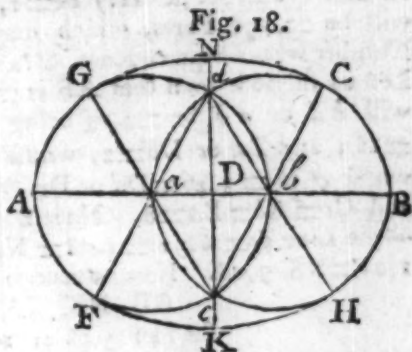
First draw the Lines AC, and make  $CF=CB$ , which will be half the Line AC; then draw DF parallel to AC; draw also AD and BE, and you will have two Squares ABDE, and B C E F; then draw the diagonal Lines AE and BF, and opening the Compasses with the Extent of AE or CE, place one Foot in E, and draw the Arch AC; then with the same Extent one Foot placed in B describes the Arch DF; then set one Foot in G, and with the Distance GA sweep the Arch DA, and with the same Extent from H sweep the Arch CF, and so is the Oval LIMK completed; and is allowed to be the neatest Oval of any Sort, and is vulgarly called the Egg Oval.

P R O B. XVII.

*Having a Line equal to the given Length of an Oval to make thereof a true Oval.*

Fig. 18.

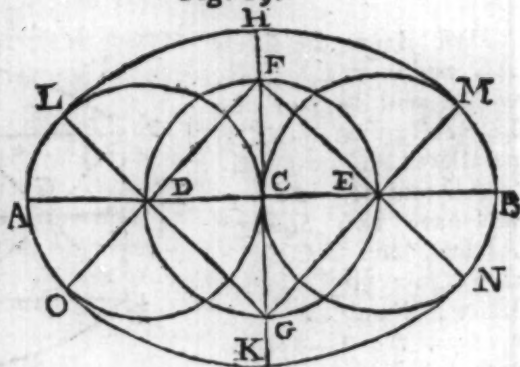
Let AB be the given Line equal to any Length; divide it first into three Parts,  $A b B$ ; then from the Point  $b$ , with the Distance  $bB$ , describe the Circle  $BaCc$ ; and upon the other Division at  $a$ , draw the Circle  $A b G c$ . These two Circles will intersect one another in the Center of each, and also at the Points  $d$  and  $c$ . Draw  $C b c$  and  $F a d$  parallel; also  $C a c$  and  $H b d$  parallel; then from  $c$  with the Distance  $G c$  sweep the Arch GNC, and from  $d$  with the same Extent sweep FKH, and you have a true Oval.



## P R O B. XVIII.

To draw an Oval from three Circles.

Fig. 19.



This Problem, in Effect, is like Prob. XVI. For having drawn the Line AB, divide it into four equal Parts, and on the three Points DCE describe three Circles, draw MG and OF parallel thereto; and also draw FN and LG parallel thereto.

Then on G, with the Extent GL or GM, describe the Arch LHM; and upon F with the same Extent describe NKO. Lastly, upon the Point D describe OAL, and upon E describe MBN, and the Oval is finished.

## O B S E R V A T I O N.

TYRO. I thank you for these kind Instructions, but pray suppose I had the transverse Diameter of an Oval given, how shall I be able to tell the Length of the conjugate before I draw it.

PHILO. Very easily, as follows: Let the transverse Diameter AB (in Prob. XVII.) be = 1, I say then the conjugate NK will be = .756 Parts, which may be thus proved. Take any Number whose Square Root, &c. may be had without Fractions. Let us suppose then that AB is = 12 Inches, Yards, &c. then will  $ad$  or  $ab$  be = 4, (being  $\frac{1}{3}$  of AB) whose Square is = 16; and  $Da$  or  $Db$  = 2, whose  $\square$  is = 4: Now  $16 - 4 = 12$  whose  $\sqrt{\phantom{x}}$  is = 3.46 =  $Dd$  or  $Dc$ . Now  $3.46 + 3.46 = 6.92 = dc$ , and  $Cc = Ab = Ba = 8$ . Now 8 (the Diameter of the Circles) — the Line  $dc = 6.92 = 1.08 = Nd$  or  $Kc$ : And  $6.92 + 1.08 + 1.08 = NK$  9.08. Now to reduce this to Unity as before, I say,

AB NK AB NK

As 12 : 9.08 :: 1 : .756, or,

AB NK AB NK

As 1 : .756 :: 12 : 9.08.

Therefore from hence you have three Numbers to find a fourth, let the Diameters be what they will.

TYRO. I understand it quite well; and I think I can find the conjugate Diameter to the Oval in Prob. XVIII.

PHILO.

PHILO. That you may, if you are certain you understand the last Operation.

TYRO. Observe then, this Oval being drawn on three Circles, I will suppose the transverse Diameter  $AB=40$ , then will  $CE \frac{1}{4}$  thereof be  $=10$ , whose  $\square$  is  $=100$  + the  $\square$  of  $CF=100$ ; both these are  $=200$ , the  $\sqrt$  of which is  $=14.14=FE=HC$ ; and  $HC+CK=HK$  28.28. Now to prove this, *Philo*, by your own Method, I say,

$$\begin{array}{cccc} AB & HK & AB & HK \\ \text{As } 40 : 28.28 :: 1 : 707 \end{array}$$

And the Angles D, E, F, G, being in a Semi-Circle, are all right; and therefore let the transverse Diameter be what it will you have the conjugate by this one Rule,

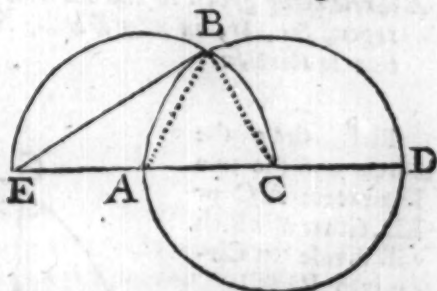
As 1:707:: any transverse to its conjugate Diameter.

P R O B. XIX.

*To draw a true Tangent to any Circle.*

Fig. 20.

Draw the Circle CA BD, and place one Foot in A, describe the Semi-Circle EBC to pass thro' the Point at B, (called the Point of Contact) then draw the Line EB, and it shall be a true Tangent to the Point of Contact B; and EC is the Secant: For the Angle BEC being in a Semi-Circle, is a right Angle.



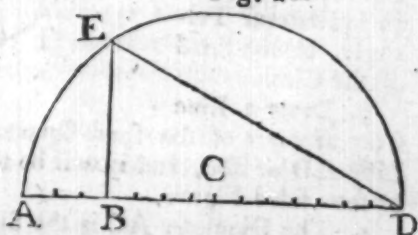
P R O B. XX.

*To reduce a Circle to a Square.*

Note, As 7 : 22, so is the Diameter of any Circle to its Circumference nearly true in whole Numbers.

Fig. 21.

Divide therefore the Diameter into fourteen equal Parts, and at seven of those Parts at C strike the Semi-Circle AD; then on three or on eleven of those Parts at B raise the Perpendicular BE; and then draw the Line DE, and it shall be the Side of a Square (very near) equal to the given Circle.



R

P R O B.



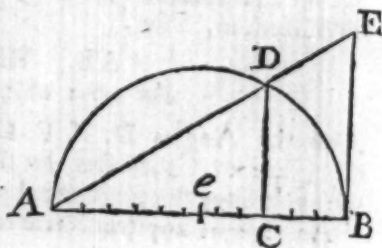
## P R O B. XXI.

*To reduce a Square to a Circle.*

*Note,* When the Side of a Square is eleven, the Diameter of a Circle equal thereto is 12.41 nearly. Therefore,

Fig. 22.

Divide the Diameter AB into eleven equal Parts, and at 5.5 of those Parts at *e* describe the Semi-Circle. Then at three, or at eight of those Parts, erect the Perpendicular CD, and the Tangent BE parallel to it. Lastly, draw AE, and it shall be the Side of a Square nearly equal to the given Circle.



## P R O B. XXII.

*A Circle being given to find the Side of a Triangle, Square, Pentagon, &c. or, in other Words, to divide it into any Parts from two to thirteen.*

Fig. 23.

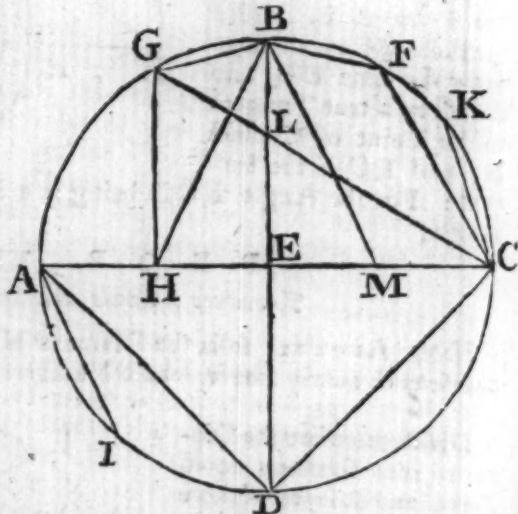
First, draw the Circle and the two Diameters AC or BD, either of which will divide the Circle into Parts.

2. Take the Radius AE, which is one sixth Part of the Circle, and set it from C to F, and again from F to G, and draw GC, it shall be the Side of an equilateral Triangle, or one third of the Circle.

3. Draw a Line from any one of the four Quarters to the next Quarter, as the Line AD or DC, and it will be the Side of an inscribed Square, or four sided Figure.

4. The Diameter AC is the Side of a circumscribed Square.

5. Let fall a Perpendicular from G to H, and draw the Line BH



BH or BM, which shall be the Side of a Pentagon, or one fifth Part of the Circle.

6. The Semi-Diameter AE or EC, &c. is the Side of a Hexagon, or one sixth Part.

7. The Line GH is the Side of a Heptagon, or one seventh Part.

8. Divide the Arch AD into two equal Parts in I, and draw AI, it shall be the Side of an Octagon, on one eighth Part.

9. Divide CFG into three equal Parts at the Point K, and draw CK, it is the Side of a Nonagon, or nine sided Figure.

10. The Line HE will be the Side of a Decagon, or ten sided Figure.

11. The Line EL is the Side of an Endecagon, or eleven sided Figure.

12. The Line FB or BG, will be the Side of a Dodecagon, or twelve sided Figure, being  $= \frac{1}{2}$  the Semi-Diameter AE, &c.

And thus may you divide the Periphery of the Circle into any Number of Parts by subdividing any of the other Lines.

TYRO. I am obliged to you, Sir, and now I shall be glad to have some Instructions in *Trigonometry*.

PHILO. I am ready, TYRO, to do you any Service; but it will be very necessary first of all that you should understand, at least know something of the Nature of *Logarithms*, for 'tis by them that we work the Doctrine of Triangles, &c.

# S E C T. VII.

## Of the Nature and Use of the Logarithms.

### 1. Of the Nature of Logarithms.

TYRO. What do you mean by the *Logarithms*?

PHILO. *Logarithms* are artificial Numbers in arithmetical Progression; first contrived by that indefatigable Nobleman Lord *Nepier*, Baron of *Merchiston* in *Scotland*, in the Year 1714, and finished by our ingenious Countryman *Henry Briggs*, of *Oxford*.

TYRO. I could wish you could tell me the Nature of constructing a Table of *Logarithms*.

PHILO. That would be impossible in this place, nor is it so necessary as to tell you the Use of them; but, however, I am willing to satisfy your curiosity as far as Room will allow of.

1. Let there be any Series of Numbers in Geometrical Progression, and a Series of Numbers in Arithmetical Progression placed over them, thus,

A. Prog. 0. 1. 2. 3. 4. 5. 6. 7. 8. 9, &c.

G. Prog. 1. 2. 4. 8. 16. 32. 64. 128. 256. 512, &c.

Or,

2. A. P. 0. 1. 2. 3. 4. 5, &c.

G. P. 1. 10. 100. 1000. 10000. 100000, &c.

R 2

These

These Numbers are increased tenfold in the Geometrical Progression, and the Numbers above them in Arithmetical Progression are the Indexes of the proper *Logarithms* belonging to them.

TYRO. I do not understand, Sir, what you mean by the Indexes to their proper *Logarithms*.

PHILO. You will soon understand this by the very first Sight of the following Table.

Numbers	Logarithms
1.	0.000000
10	1.000000
100	2.000000
1000	3.000000
10000	4.000000
100000	5.000000, &c.

3. Now from Unity or Number 1, there is no Index or whole Number till you come to the Number 10; the Number 10, and every other Number from 10 to 100 has 1 for their Index; thus the *Logarithm* of 5 is                      of 7 is                      which have no Index, but the *Logarithms* are like Decimal Fractions without a whole Number before them; but from 10 to 100 the Index is 1. Thus the *Logarithm* of 95 is 1.9795.

4. Again, all Numbers from 100 to 1000 have 2 for their Index and a Number besides, which look like a whole Number and a Decimal after it. Thus the *Logarithm* of 954 is 2.9795.

5. So also all Numbers from 1000 to 10000 will have 3 for their Index; thus the *Logarithm* of 9541 is 3.97959.

See another Example.

Numbers	Logarithms
954	2.979548
95.4	1.979548
9.54	0.979548
.954	.979548
.0954	.879548
.00954	.779548
.000954	.679548, &c.

Thus you see that when the Number consists of 5 Places, the Index is 4; when it consists of 4 Places, the Index of the *Logarithm* is 3, &c. always observe the Index is 1 less than the Number given.

TYRO. Now, Sir, I understand you; but I suppose it would be necessary to have a Table of *Logarithms*, would it not?

PHILO. Most certainly, and tho' *Sherwin's* Tables are counted the best (or as good as any) yet there are many others that will equally answer your Purpose.

2. Of the Use of the Tables of Logarithms.

**TYRO.** How may I most readily find the *Logarithm* to any Number?

**PHILO.** 'Tis so easy that there needs no farther Direction than this: Turn to the Number itself in the Table under N, and against it you will find the *Logarithm*, to which prefix the Index 1 Place or Number less, as before directed, provided the Tables have no Index, as some have not. Thus you will find the *Logarithm* of 46 to be                      of 540 to be                      and 987 to be

But if you want a Decimal of a mixt Number, suppose 547. 6 tenths; look for the Number 547, and carry your Eye in the same Line or Direction to the right Hand till you come to the Column that is under 6 at the Top of the Tables, and you will find the *Logarithm* to be 738463; and the given Number having 3 Places of Figures (*viz.* 547) I conclude the Index must be 2; therefore the true *Logarithm* is 2.738463. The same is to be observed for any other Number or Numbers.

*Note.* Thus by having any *Logarithm* you may find the Number belonging to it by searching the *Logarithm*, or nearest *Logarithm* and its correspondent nearest whole Number.

3. To find the *Logarithm* of a Vulgar Fraction.

First find the *Logarithm* of the Denominator, and then take the *Logarithm* of the Numerator out of it, and you have the *Logarithm* of the Vulgar Fraction.

*Example.* Let the Vulgar Fraction be  $\frac{54}{432}$   
The *Logarithm* of the Denominator 432 is 2.635484  
The *Logarithm* of the Numerator is 1.732394

.903090

If it be a mixt Number, reduce it to an improper Fraction, and take the *Logarithm* of the Denominator out of the *Logarithm* of the Numerator. Thus you will find  $47\frac{7}{12} = \frac{571}{12}$  whole *Logarithm* is 1.677455.

4. The Use of the Logarithms to multiply one Number by another.

Add the *Logarithm* of the Multiplicand and Multiplier together, and the Sum is the *Logarithm* of the Product.

Multiply 83 *Logarithm* = 1.919078

by 12 *Logarithm* = 1.079181

Product: 996      Lag. = 2.998259

R. 3;

Division



*Division by the Logarithms.*

Subtract the *Logarithm* of the Divisor out of the *Logarithm* of the Dividend, and the Remainder is the Quotient.

Divide 648 by 72	
<i>Logarithm</i> of 648 is	2.811575
of 72 is	1.857332

Quotient or Answer	0.954243
--------------------	----------

So also the Quotient of 434.34 by 7.62 is  $570 = 2.755874$ .

*To extract the Square Root.*

Divide the *Logarithm* of the given Number by 2; and the Quotient is the *Logarithm* of the Root required.

What is the Square Root of 144?

*Logarithm* 2.158362

2)1.079181 Answer.

So also the Square Root of 2830.24 is 53.2, whose *Logarithm* is 1.725911.

*Cube Root.*

Divide the *Logarithm* of the given Number by 3, and you have the *Logarithm* of the Root required.

I demand the Cube Root of 729?

The *Logarithm* of 729 is 2.862728.

Divide by 3).954242 Answer.

What is the Biquadrate Root of 625?

The *Logarithm* of 625 is 2.795880

Divide by 4).698970 Answer.

## D I A L O G U E II.

*Of Trigonometry.*

## S E C T. I.

TYRO. I am afraid I shall not be able to understand any Thing of *Trigonometry*.

PHILO. You always had this Fear; but, however, I commend you for it, since it does not conquer your Resolution to try at that which is proposed to you: I must own 'tis very modest

deft in you ; but yet I never knew, TYRO, but what you could always understand any thing that has hitherto been propounded.

TYRO. But how am I to work *Trigonometrical Questions* ?

PHILO. By the *Logarithms* as I faid before ; but you muft find out the different *Angles, Sines, Tangents, and Secants*, by meafuring them upon a Scale of Chords Sines and Tangents ; tho' the beft Inftrument is a *Sector*, becaufe you may then draw your Circles larger or smaller at Pleafure.

TYRO. But I don't know at prefent what a *Sector* is, and how can I know its Ufe ?

PHILO. I fhall fhew you the Ufe of this, and feveral other Inftruments by and by ; but, however, I will give you here a little Idea of it, which will be of fome Service.

### *Of the Sector.*

The *Sector* is made like a common Rule, but of various Sizes, fome being (when fhut) 6, others 8, 9, or 12 Inches long, which are called 6, or 12 Inches in Radius.

As there are a Variety of Lines upon this Inftrument (of which I fhall more fully treat of hereafter) it will be fufficient for the prefent to fpeak only of the Line of *Lines, Chords, Sines, and Tangents*, as follows :

1. The Line of *Lines* (mark'd L) runs from 1 to 10, and you may call the firft 1 Ten, and then 2 will be 20 ; 3, 30, &c. to 100.
2. The Line of *Chords* (mark'd C) runs from 1 in the Center to 60.
3. The *Sines* (mark'd S) begin with 1 and end at 90. And
4. The *Tangents* (mark'd T) run from 1 to 45.

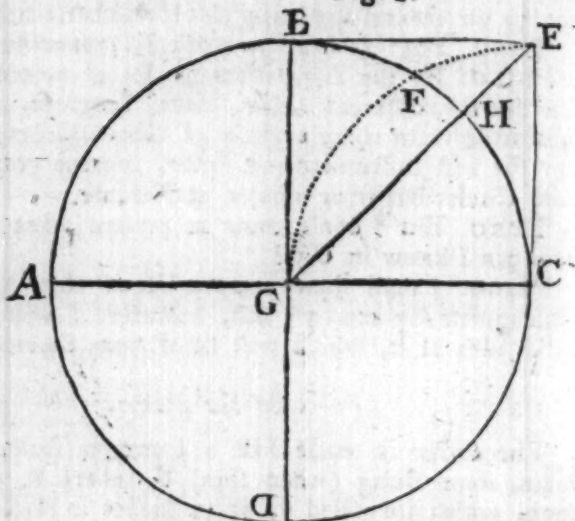
N. B. Here you are particularly to obferve, that any Circle being defcribed at Pleafure, the Radius is called, or is  $= 60^\circ$ . That is, let the Sector be fhut or opened at Pleafure, then fet one Foot of the Compaffes in the little Brafs Point on the Chords, and extend the other Point to 60 on the other Leg of the Sector, and with that Difance defcribe any Circle, then that fame Difance will reach from 90 to 90 on the Sines, and from 45 to 45 on the Tangents.

TYRO. I heartily thank you, Sir, but could wifh you would demonftrate it to me by fome familiar Example.

PHILO.

Fig. 1.

PHILO. Observe then I say the *Chord* of  $60^\circ$ , the *Sine* of  $90^\circ$ , and the *Tangent* of  $45^\circ$ , are all equal. For describe the Circle  $ABCD$ , then take the Radius  $AG$  or  $GC$ , and open or shut the *Sector* till  $AG$  or  $CG$  will reach from 60 to 60 on the *Chords* cross-ways, or from *Leg* to *Leg*, with this Distance make a little Dash at  $F$ , so will  $CF$  be the *Chord* of 60.



2. Bisect the Quadrant  $BC$   $90^\circ$ , and make  $CH = 45^\circ$ , and draw the *Secant*  $GHE$ .

3. Draw the *Tangent*  $BE$  or  $CE$ ; I say then that the *Chord* of  $60^\circ$ , viz.  $CF$ , the *Tangent* of  $BH$  or  $CH = 45^\circ$ , and the *Sine* of  $90^\circ$ , viz.  $GB$  or  $GC$ , are all equal to *Radius*, and consequently equal to one another. Do you understand it now?

TYRO. Yes, Sir, very plainly.

PHILO. Then we will proceed to some practical Operations.

## S. E. C. T. II.

### Plain Trigonometry.

TYRO. If there be any Thing more necessary for me to know, dear PHILO, let me beg you would explain it to me.

PHILO. I think there is no great Necessity, but, however, perhaps a full drawn Scheme to unfold more of the Nature of *Sines*, *Tangents*, &c. may not be amiss: What say you?

TYRO. Sir, I return you thanks for your Care.

PHILO,

Fig. 1.

PHILO. Ob-  
serve then,

Take the *Setſor*, and open or ſhut it till the Line of *Chords* from  $60^{\circ}$  to  $60^{\circ}$  croſſways be made = to AG or CG (or if you like it better, any other Diſtance at Pleaſure) then with one Foot of the Compaſſes in C, with the Diſtance CG, deſcribe the little Daſh at E, which is the *Chord* of  $60^{\circ}$ .

2. From C raise the Perpendicular CF, it shall be the *Tangent* of  $60^{\circ}$ .

3. From the Center G draw GF thro' E, and GE shall be the *Secant* of  $60^{\circ}$ .

4. Let fall the Perpendicular EH, and it shall be the *Sine* of  $60^{\circ}$ .

5. The Line HC is the *versed Sine* of  $60^{\circ}$ .

Again,

The remaining Part of the Quadrant to 90, *viz.* BE is  $= 30^\circ$ , for CE 60 + EB 30 = 90. Now the Sine of BE is KE, which is the Cofine of CE; BI is the Tangent of 30, which is the Co-tangent of CF, and GI is the Secant of 30, and BK is the *versed Sine*.

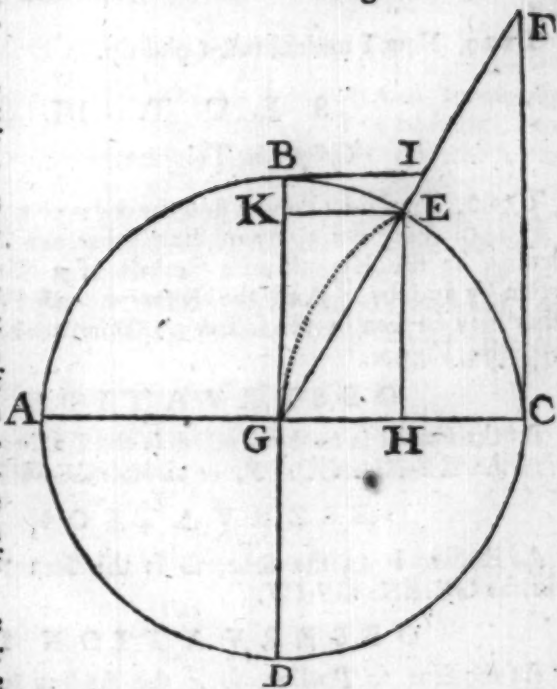
N. B. Pray remember that the *versed Sine* and *Sine Complement*, are equal to the Radius or Semi-Diameter.

Do you understand it?

TYRO. I understand it very well, except that I can't see at present that the *versed Sine* and *Sine Complement* are equal to the Radius.

PHILO. That's surprizing. Observe then first the *versed Sine* of CE is CH, and the *Sine Complement* of CE is KE = GH; now CH + KE, or GH = GC the Radius.

Again, the *versed Sine* of the Arch BE is BK, and the *Sine*  
Com-





Complement of BE is  $EH = GK$ ; now  $BK + GK = \text{Radius GB.}$

TYRO. Now I understand it plainly.

### S E C T. III.

#### Of plain Trigonometry.

TYRO. Pray how do you find the Sides of a plain Triangle?

PHILO. Very easily, by making either the Base, the Perpendicular, or the Hypotenuse Radius of a Circle, as will be shewn by and by. And the Relation and Proportion to each other may be seen by the following Observations drawn from the foregoing Figure.

#### OBSERVATION I.

As the Cosine is to the Sine, so is the Radius to the Tangent, viz. As  $KE:EH::GC:CF$ , or as  $HE:KE::GB:BI$ .

#### OBSERVATION II.

As Radius is to the Sine, so is the Secant to the Tangent, viz. as  $GE:EH::GF:CF$ .

#### OBSERVATION III.

As the Sine to Radius, so is the Radius to the Co-Secant, viz. as  $EH:EC::EG:IG$ .

#### OBSERVATION IV.

As the Tangent to the Radius, so is the Radius to the Co-Tangent, viz. as  $CF:CG::CG:IB$ .

#### OBSERVATION V.

From the foregoing Observations it appears, that the Rectangle made by the Tangent and Co-Tangent of any Arch is equal to the Square of the Radius.

#### OBSERVATION VI.

Every Triangle has six distinct Parts, that is, three Sides and three Angles; three of which being given the other three are easily found.

#### OBSERVATION VII.

The Angles of a Triangle are found by a Scale of Chords, and the Sides are found by a Scale of equal Parts, or by the Rule of Three in common Arithmetic.

#### OBSERVATION VIII.

If any Angle be given larger than  $90^\circ$ , and cannot be found in the Tables, then work with the Complement thereof to  $180^\circ$ .

OBSERVA.

## OBSERVATION IX.

From the foregoing Observations it is very easy to perceive, that whatever Part of a Triangle is required to be found, there is in any Table of Logarithms (particularly *Sherwin's*) the *Sine*, *Tangent*, and *Secant*, of such a Triangle ready calculated, and that if the Sides be given in Miles, Rods, Yards, Feet, or Inches, and the Angles to any Degree; that the Sides and Angles opposite to, or answering such Sides, will always be in Proportion to each other. This being duly considered, any Angle, or Side of a Triangle, may be found as follows.

## OBSERVATION X.

In all Cases relating to right-angled plain Triangles, this *one* Rule solves all, *viz.* Let any one of the Sides be made Radius, (which of course will then be the whole Sine of 90, or Semi-Diameter of a Circle) then the other two Sides will become Sines, Tangents, and Secants of such Sides, according to the last Figure.

## S E C T. IV.

*A further Demonstration of the Doctrine of right-angled Triangles, every Side thereof being alternately made Radius.*

## C A S E I.

Fig. 1.

In the right-angled Triangle ABC, let the Perpendicular (or Cathetus) BC be made Radius.

First, set one Foot of the Compasses in B, and extend the other to C, and sweep the Arch CD (which observe is Part of a whole Circle, whose Semi-Diameter is BC). Then,

1<sup>st</sup>. CD is the Chord, or the Measure of the Angle at B.

2<sup>dly</sup>. CA 'tis evident is the Tangent of the Angle B. And,

3<sup>dly</sup>. BA is the Secant of the same Angle.

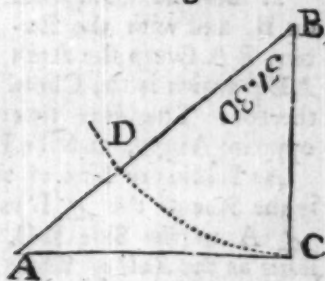
Therefore,

As Radius or Sine of  $90^\circ$  BC : BC (now Radius) :: is the Tangent of the Angle B : CA the Tangent itself.

Or,

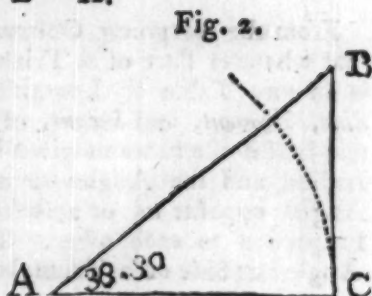
As BC is : Radius (or Sine of  $90^\circ$ ) :: so is the Side AC : the Tangent AC. The same for the Secant.

## C A S E



## C A S E II.

Now make the Base AC Radius, and set on Foot of the Compasses in A; sweep the Arch DC, which is the Chord or Measure of the Angle A; CB is the Tangent, and AB the Secant thereof; and the Proportion holds good as in Case I.

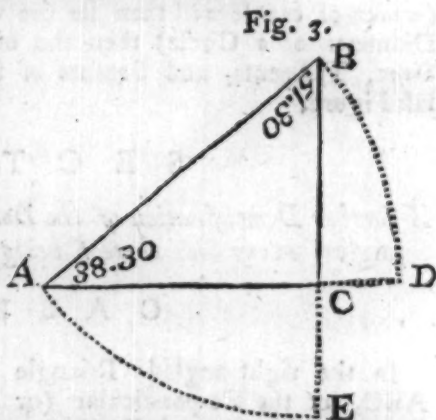


## C A S E III.

*The Hypotenuse being made Radius.*

1. Set one Foot of the Compasses in A, and extend the other to B, and describe the Arch BD, then it is evident by the Figure in *Sett.* II. that BD is the Chord, and BC is the Sine of the Angle A, and CD the versed Sine. Again,

2. Set the Compasses on B, and with the Extent BA sweep the Arch AE; which is the Chord of the Angle B, and AC is the Sine thereof: Therefore 'tis evident that every Side is the Sine of its opposite Angle, and the Proportion is



As Radius or Sine of the Angle at C is to the Side AB, so is the Sine of the  $\angle$  B to the Side AC; or so is the Sine of the  $\angle$  A to the Side BC, &c. In short, the Proportion is the same as the *Rule of Three* in common Arithmetic. For the first and third Term, and the second and fourth Term, must be one Name. That is, if the first Term be an Angle, the third must be an Angle; if a Side, the third must be a Side; and so also whatever is required must be your second Number, and then your fourth Number will be the Answer to the Thing required, as in the Rule of Three. See Observation VII.

TYRO. I understand it plainly.

PHILO. Then we will proceed to

## S E C T. V.

Practical Trigonometry, or to measure or find the Sides or Angles of any Triangle.

TYRO. How am I to find the Sides and Angles of a Triangle?

PHILO. If an Angle be required, let your first Number be a Side; if a Side be required, let your first Number be an Angle, or the Sine or Tangent of such an Angle: Then work as in the Rule of Three direct, by the general Rule in Prob. I. &c.

*An Explanation of other Signs.*

S stands for *Sine*. Sc for *Cofine*, or *Sine Complement*. T for *Tangent*. Tc for *Co-tangent*. Se for *Secant*. Cs for *Co secant*.  $\nabla$  for *Angle*.  $\nabla$ s for *Angles*. Ar. Com. for *Arithmetical Complement*. X for *Difference*. Z for *Sum*.

These being understood we will proceed to the seven regular Cases in the Doctrine of a right-angled Triangle, as follows.

## C A S E I.

The two acute Angles A and B, with the Base AC being given, to find the Perpendicular BC.

These Problems are perform'd three different Ways, as under, but in all of them you have

*A general Rule.*

Add the Logarithm of the second and third Term together, and from their Sum subtract the Logarithm of the first Term, and the Remainder is the Logarithm of the fourth Term (or Answer) required.

1. By making the Perpendicular BC Radius \*.

\* See Fig. 1. the last Section.

As the T of the  $\nabla$  B  $51^{\circ} 30'$  Log. 10.099395

To the Base AC 144, - - - - Log. 2.158362 } add  
So is Rad. or S of  $90^{\circ}$  - - - - Log. 10.

(Having taken out the Top Log.) 12.158362  
To the Perpendicular BC 112.5, Log. 2.058967 Ans.  
2. By making the Base AC Radius †,

† See Fig. 2. in the last Section.



As Radius or S  $90^\circ$ , - - - - Log. 10.

To the Base AC 144, - - - - Log. 2.158362  
 So is the T of the  $\sphericalangle$  A  $38^\circ 30'$  Log. 9.900605 } add

To the Perp. ABC 112.5 (abating Rod) Log. 12.058967

3dly. By making the Hypothenuſe AB Radius \*.

\* See Fig. 3. in the laſt Section.

As the S of  $\sphericalangle$  B  $51^\circ 30'$ , - - - - Log. 9.893544

To the Base AC 144, - - - - Log. 2.158362  
 So is the S of the  $\sphericalangle$  A  $38^\circ 30'$ , Log. 9.794149 } add

(Abating the top Log. from this) 11.952511  
 To the Perpendicular BC 112.5, Log. 2.058967

TYRO. Theſe Examples appear very plain to me: But in the Explanation of the Signs you mention'd ſomething about *Arithmetical Complement*, or *Co-Arithmetic*, I can't ſay I underſtand that at preſent.

PHILO. The *Arithmetical Complement* is only ſubtracting the Logarithm of the Sine of any Arch out of Radius or 10.000000; or otherwiſe add ſuch Figures to the Sine as will make every Figure in the Logarithm Cyphers, and is *Co-Arithmetic*.

Thus the S of  $51^\circ 30'$ , - - - - Log. 9.895544  
 To this I add - - - - 0.106456

And the Sum makes Radius, viz. 10.  
 Or from this Radius take  $51^\circ 30'$ , 9.893544

Gives alſo the Arithmet. Complement 0.106456

TYRO. I underſtand it plainly, but pray what is the Uſe of this?

PHILO. In all Caſes where Radius is not in the Proportion; (as in this laſt Example) then inſtead of the firſt Term or Sine of  $51^\circ 30'$ , I uſe the *Arithmetical Complement* of it to  $90^\circ$  for the firſt Term, and ſet the other two Terms under it as before, and now add all the three Terms together, (and from their Sum ſubtract Radius) and you have the Answer.

Thus in the foregoing Example.

As the S of  $\sphericalangle$   $51^\circ 30'$ , Ar. Com. Log. 0.106456  
 To the Base AC 144, - - - - 2.158362  
 So is S of  $\sphericalangle$  A  $38^\circ 30'$ , - - - - 9.794149 } add

To the Perp. BC 112.5 (abating Rad.) 2.058967

Same

Same by Gunter.

Always remember to extend from one Term to the Term of the same Name on the same Line; and that Extent will reach from the other Term to the Answer on the same Line, be it Sines or Numbers, &c.

Thus I set one Foot of the Compasses in  $51^{\circ} 30'$  in the Line of Sines, and extend the other to  $38^{\circ} 30'$  (its Complement) in the same Line: This Extent I carry to the Line of Numbers, and setting one Foot on 144 ( $= AC$ ) I turn the other backwards and find it touches 112 and 5 parts, viz.  $112\frac{1}{2}$  the Perpendicular BC as before. Take this for a general Rule.

TYRO. I thank you, kind PHILO.

## CASE II.

The two acute Angles A and B, with the Base AC, being given to find the Hypothenufe AB\*.

\* See Figures 1, 2, 3, in Section IV.

1. By making the Base Radius.

As Radius, - - - - -	Log. 10.	
To the Base AC 144, - - - - -	2.158362	} add
So is the Se. † of $\angle A 38^{\circ} 30'$ - - - - -	10.106459	
To the Hypothenufe AB, viz. 168.5		
(abating Radius) - - - - -	12.264818	

2. By making the Hypothenufe Radius.

As the S $\angle B 51^{\circ} 30'$ , - - - - -	Log. 9.893544	
To the Base AC 144, - - - - -	2.158362	} add
So is Radius 2 - - - - -	10.	
To the Hypothenufe AB 168.5, - - - - -	2.264818	

3. Or by making the Perpendicular Radius.

As the T of $\angle B 51^{\circ} 30'$ , - - - - -	Log. 10.099395	
To the Base AC 144, - - - - -	2.158362	
So is the Se of $\angle B 51.30$ - - - - -	10.205851	
(Abating the top Logarithm) - - - - -	12.364213	
To the Hypoth. AB 168.5, - - - - -	2.264818	

† Note, The Secant of any Arch or Angle is only subtracting the Logarithm of the Sine Complement of that Arch out of the double Radius, viz. 20.00000; thus the given Secant is  $38^{\circ} 30'$ ; the Sine of its Complement is  $51^{\circ} 30'$ , viz. 9.893544, which taken out of 20.00000 leaves 10.106456, as above.

## C A S E III.

*The two acute Angles A and B, with the Hypothenufe AB, being given to find the Base AC.*

1. By making the Hypothenufe Radius.

As Radius or S of $90^\circ$ ,	-	Log. 10.	
To the Hypothenufe AB 168.5,	-	2.264818	} add
So is S of $\angle B 51^\circ 30'$ ,	-	9.893544	
To the Base AC 144,	-	2.158362	*

\* Remember when you add these two together to subtract the top Logarithm for the Answer.

2. By making the Base Radius.

As the Se. of $\angle A 38^\circ 30'$ ,	-	Log. 10.106456	
To the Hypoth. AB 168.5,	-	2.264818	
So is Radius,	-	10.	
To the Base AC 144, as above,	-	2.158362	

3. By making the Perpendicular.

As the Se. of $\angle 51^\circ 30'$ , Arith. Com.	Log. 9.894149	} add
To the Hypoth. AB 168.5,	- 2.264818	
So is the T of $\angle 51^\circ 30'$ ,	- 10.099395	
<hr/>		
To the Base AC 144,	- - 2.158362	

## C A S E IV.

*The Base AC and Perpendicular BC, being given to find the two acute Angles A and B.*

1. By making the Perpendicular BC Radius.

As the Perpendicular BC 112.5,	Log. 2.058967	
To Radius or S of $90^\circ$ ,	10.	} add
So is the Base AC 144,	2.158362	
To the T of the $\angle B 31^\circ 30'$ ,	10.099395	
Whose Complement to $90^\circ$ or a right Angle is $38^\circ 30'$ the $\angle A$ .		

2. By making the Base AC Radius.

As the Base AC 144,	Log. 2.158362	
To the Radius,	10.	} add
So is the Perpendicular BC 112.5,	2.058967	
To the T of the $\angle A 38^\circ 30'$ ,	9.900605	
Whose Complement to $90^\circ$ is $51^\circ 30'$ the $\angle B$ .		

CASE

C A S E V.

*The Base AC and the Hypothenufe AB, being given to find the two Angles A and B.*

1. By making the Hypothenufe AB Radius.

As the Hypoth. AB 168.5,	- - -	Log.	2.264818	
To Radius,	- - - - -		10.	} add
So is the Base BC 144,	- - - - -		2.158362	
To the S of the $\angle B$ $51^{\circ} 30'$ ,	- - - - -		9.893544	
Whose Complement is $38^{\circ} 51'$ the $\angle A$ .				

C A S E VI.

*The Base AC and Perpendicular BC, being given to find the Hypothenufe.*

By making the Hypothenufe Radius to find the Angles.

As the S of the $\angle B$ $51^{\circ} 30'$ ,	- - -	Log.	9.893544	
To the Base AC 144,	- - - - -		2.158362	} add
So is Radius $90^{\circ}$ ,	- - - - -		10.	
To the Hypothenufe AB 168.5,	- - -		2.264818	

C A S E VII.

*The Base AC and the Hypothenufe AB, being given to find the Perpendicular and the two acute Angles.*

1. By making Hypothenufe Radius to find the Angles.

As Hypothenufe AB 168.5,	- - -	Log.	2.264818	
To Radius,	- - - - -		10.	
So is the Base AC 144,	- - - - -		2.158362	
To the S of $\angle B$ $51^{\circ} 30'$ ,	- - - - -		9.893544	
Whose Complement is $38^{\circ} 30'$ the $\angle A$ .				

Or,

2. As Radius, - - - - - Log. 10.

To the Hypothenufe AB 168.5,	- - -		2.264818	
So is the S of the $\angle A$ $38^{\circ} 30'$ ,	- - -		9.794149	
To the Perpendicular BC,	- - - - -		2.058967	

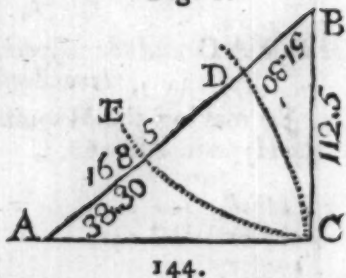
*Geometrically.*

Any of the foregoing Cases may be wrought geometrically, by a Scale of Chords and equal Parts.



Fig. 1.

First draw the Line or Base AC at Random, and from any diagonal Scale, or Scale of equal Parts, take 144, and set it from A to C the Base, and from C raise the Perpendicular CB, then take  $60^\circ$  in the Line of Chords in your Compasses and set one Foot in A describe the Arch DC, and from the same Line of Chords take  $38^\circ 30'$  and set from C to D, then draw AB through the Point D till it cuts the Perpendicular in B, then if you measure AB upon the same Scale, you will find it 168.5; and CE on the Chords  $51^\circ 30'$ .



N. B. You may find the other Angles or Sides by the same Method, by making  $BC=60$  on the Chords, and striking the Arch  $CE=51^\circ 30'$ , &c. as by the Figure.

Thus, TYRO, I have given you a full Description of the Nature and Property of *right-angled Triangles* in all the various Cases; and if you now turn back to Section IV. you will more fully understand the Proportion of the Sides and Angles laid down in the three Observations thereunto belonging.

## S E C T VI.

### *Of oblique-angled Triangles.*

TYRO. I understand very well, kind PHILLO, what you have hitherto shewn me, and now beg your further Instruction in *oblique Triangles*.

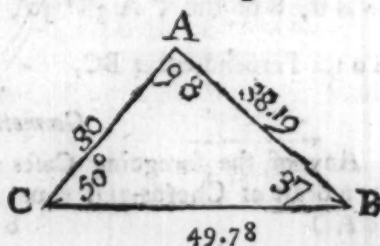
PHILO. I will, but then I shall not work every Problem or Question as I have hitherto done; yet I will not leave you wholly without Examples; for I shall give you the real Proportion that the Sides and Angles have to one another, and then the Operations will be easy and the Work the same as in the foregoing Examples.

## C A S E I.

*Two Sides and an Angle opposite to one of them being given to find the other Parts.*

Fig. 1.

In the Triangle ABC let the Side  $CA=30$  Parts,  $BC=49.78$ , and the  $\angle B=37^\circ$ , to find the obtuse  $\angle$  at A.



Proportion.

As the Logarithm of the Side CA 30 : S  $\angle$  B  $37^\circ$  :: Log. of Side BC 49.78 : S  $\angle$  A  $93^\circ$  Answer.

*Note*, That three Sides of every Triangle (as was said before) are equal to two right ones, or  $180^\circ$ : Thus  $50+93+37=180$ .

C A S E II.

*The Angle B  $37^\circ$ , the Side AC=30, and the Angle C  $50^\circ$  given to find the Side AB.*

Proportion.

As the S of  $\angle$  B  $37^\circ$  : Log. of the Side AC 30 :: S of  $\angle$  AC  $50^\circ$  : Log. of the Side AB 38.19.

C A S E III.

*The Angles A  $93^\circ$  and B  $37$  being given, to find the Side BC.*

*Note*, The  $\angle$  B being  $3^\circ$  more than a right Angle, therefore I work with the Complement of 93, to 180, viz. 87. See this Work.

Arith.Com.

As the S $\angle$ B $37^\circ$ ,	- - - - -	Log. 0.22054
To the Side AC $30^\circ$ ,	- - - - -	1.44712
So is the Sc. of $87^\circ$ ,	- - - - -	<u>9.99940</u>

To the Side CB 49.78 (abating Rad. or 10)	1.69706
---	---------

C A S E IV.

*The Sides CB 49.78, and CA 30 Parts, and the  $\angle$  C  $50^\circ$  being given to find all the other Parts and Properties.*

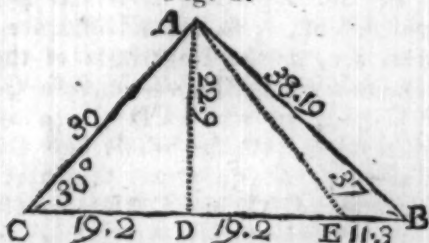
First, Having drawn the former oblique Triangle A'BC, I divide it into two right-angled Triangles by the Perpendicular AD, and then proceed as follows:

First,

The Side BC 30 the  $\angle$  at C  $50^\circ$ , and the right D being given, 'tis required to find the  $\angle$  A, together with the Base CD and Perpendicular DA.

Now to find the Perpendicular AD, you will first note that the  $\angle$  at A must be  $=40$  (being the Complement to the  $\angle$  C 50 to a right Angle) therefore the

Fig. 2.



## 1st Proportion.

As Radius or S  $90^\circ$  : to the Log. CA 30 : So is the Sine of the  $\angle C 50^\circ$ , to the Log. of the Perpendicular AD 22.9 Parts.

## 2d Proportion.

As Radius or S of  $90^\circ$ , to the Log. AB 30 Parts : So is the S of the  $\angle A 40^\circ$ , to the Perpendicular AD 22.9, as before.

## C A S E V.

*In the Triangle ABD (in the preceding Figure) let there be given the Side AD 22.9, and the right Angle D, to find the Sides DB and AB, and the Angles A and B.*

## First,

To find DB, take GD 19.2 out of the whole Side CB 49.7, there remains the Base DB 30.5 : So you have the two Sides of the Triangle DAB, viz. DB = 30.5 and AD = 22.9, and the  $\angle$  at D a right one ; therefore, as the Log. of AD, to the Radius or S of  $90^\circ$ , so is the Log. of the Base DB 30.5, to the Log. of the Tangent of the  $\angle$  of the  $\angle A 53^\circ$ .

Now the  $\angle B$  is only the Complement of the  $\angle A$  to  $90^\circ$  which is  $37^\circ$ .

## Secondly,

*To find the Hypothenufe AB, this is the Analogy or Proportion.*

As the S of  $\angle A 53^\circ$ , to the Log. of the Base DB 30 ; so is Radius to the Log. of the Hypothenufe AB 38.19 (or 38.2 nearly). And thus you have the Angles CAD  $40^\circ$  + the Angle DAB  $53^\circ$  = the Angle CAB =  $93^\circ$ .

## C A S E VI.

*The three Sides of an oblique angled Triangle being given to find the Angles.*

## 2. Now to find the Segment EB the Analogy is

As the Logarithm Base CB 49.7. To sum of Sides CA and AB 68.1 ; so is the Difference of the Sides CA and AB, viz. 8.1, to the Logarithm of the Segment EB 11.1. Now take this out of the whole Base CB 49.7, the Remainder is EC 38.4, of which CD is 19.2 and DE 19.2 ; therefore CD 19.2 taken from the whole Base 49.7, leaves the Base of the Triangle DB = 30.5, and thus have you all the Sides of the two Triangles CAD and DAB ; therefore,

## 3. To find the Angles A and B.

As the Logarithm of Hypothenufe BC 38.1 to Radius, so is the Logarithm of the Base CD 30.5, to the Sine of the  $\angle A 53^\circ$ , whose complement to  $90^\circ$  is the  $\angle B 37^\circ$ .

## 4. To

4. To find A and C.

As the Logarithm of CA 30, to radius; so is the Logarithm of CD 49.2 to the Sine of the  $\angle$  A  $40^\circ$ , whose Complement to 90 is the  $\angle$  C 50.

*Proof.*

From the foregoing Operations all the Parts of the Triangle CAB are known; and though it is difficult sometimes to tell whether the Angle at A may be obtuse or not, yet by these Methods it is easily found; for the  $DAB=53$ , and  $CAB=40$ , now  $50+40=93$  the  $\angle$  A of the triangle CAB. Do you understand it, TYRO?

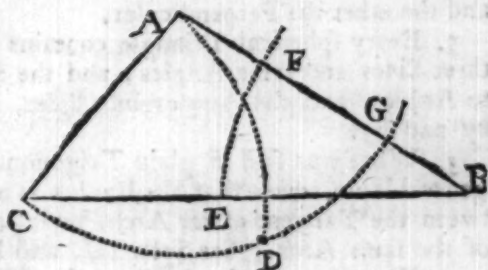
TYRO. If you can by any Figure, yet more fully demonstrate the three angles of an oblique angled Triangle, I should be thankful.

PHILO. I will endeavour, TYRO, to do it: and you must remember that I told you, that sometimes all the Angles will be acute, and never but one obtuse, which will always be the Angle opposite the longest side; and all of them will be  $=180^\circ$ ; and you may find each Angle as in any other Triangles, by making each Side Radius (on any Scale of Chords) as by the following Figure.

EXAMPLE.

I demand the Angles A, B, and C, separately, of the Triangle ABC.

First, I take the Line AC in my Compasses, and make it a Parallel of 60 on the Sector in the Line of



Chords (or on a small Scale) and sweep the Arch AD; and with the same Extent, one Foot in B sweep the arch EF; then take AD and measure it on the same Scale, you will find it  $49^\circ 15'$ , and EF  $33^\circ 15'$ ; that is, the Angle C is  $49^\circ 15'$  + the  $\angle$  B  $33^\circ 15'$  is  $=82^\circ 30'$ ; therefore the Angle A, viz. the Arch CG will be found to be  $97^\circ 30'$ , for  $97:30+82:30=180$ .

*Note.* You cannot measure CG at once, being above 60; therefore prick off  $60^\circ$  from CG to D, and make a Dot in the Arch CG at D; and then take the Remainder DG, and you will find it  $37^\circ 30'$ : Or make a Dot at Random, any where in the Arch CG, and measure the two Parts separately, you will find it the same, viz.  $97^\circ 30'$



## S E C T. VII.

*Of Spherical Triangles.*

TYRO. What do you mean by a *Spherical Triangle*, and how is it made?

PHILO. 1. A spherical Triangle is a Part of the Surface of a Sphere or Globe; formed or made by the Intersection of three Arches of a Circle, drawn upon, and intersecting each other on the Surface thereof; and as the Sides of *right lined Triangles* are measured by a Scale of equal Parts, these are measured by a Scale of equal Degrees and Minutes or Miles.

2. *Great Circles* are such as cut the Sphere or Globe in two equal Parts; such are the Equator, the Ecliptic, the Horizon, &c.

3. Every spherical Triangle is either right, or else obliquely angled.

4. That in any right angled spherical Triangle, the Side subtending, or that is opposite to the right Angle, is called the Hypothenuse; the other two Sides are generally called Sides, but for Distinction sake either of them may be called the Base, and the other the Perpendicular.

5. Every spherical Triangle contains six distinct Parts, *viz.* three Sides and three Angles; and the Sides may be turned into Angles, and the Angles into Sides, as will be demonstrated by and by.

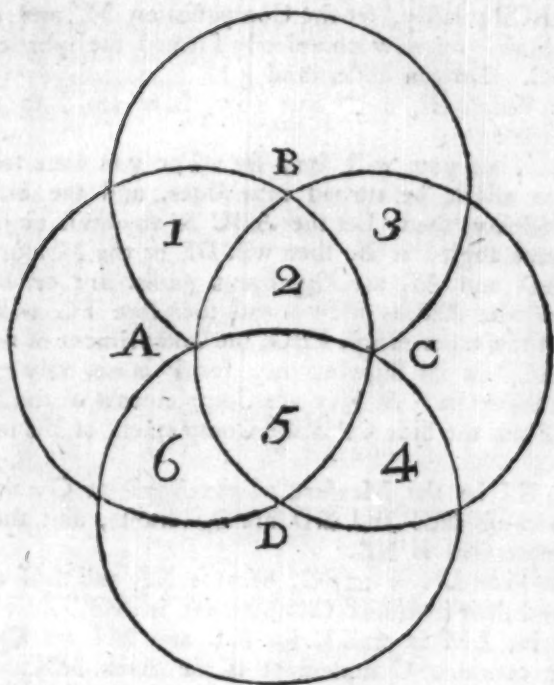
5. What was said in plain Trigonometry, stands here for a general Rule, *viz.* that the Radius is a *Mean Proportional* between the Tangent of an Arch, and the Tangent complement of the same Arch. See Sect. III. and IV.

7. The Sines of the Angles of a spherical Triangles are in Proportion to the Sines of their opposite Sides, and the Sines of their opposite Sides to the Sines of their opposite Angles.

Thus much at present suffices; therefore, TYRO, you shall now see how a spherical Triangle is made.

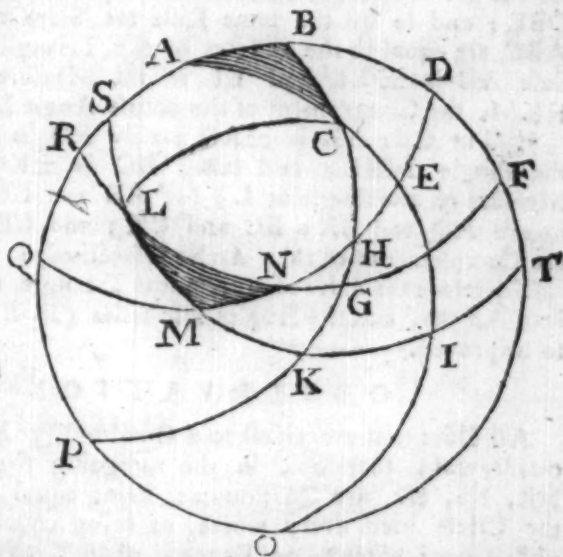
*To make a right angled spherical Triangle.*

1st. Open the Compasses to any Distance at Pleasure, and describe the Circle on the Center C; then setting one Foot on the Periphery of the Circle C at A, describe A, which will pass through C; then, at the Intersections of these two Circles at B and D, describe the Circles B and D, so you will have six right angled spherical Triangles, marked 1, 2, 3, 4, 5, 6, as in the annexed figure.



*To draw a spherical Triangle ABC.*

First, upon the Centre N, draw the Circle ATOQ, and make three Dots (promiscuously) at A B C. 2. Set one Foot of the Compasses A, and with the Distance NA describe the Arch DNQ; then set one Foot in B, and describe FNR; then set one Foot in C, describe the Arch TLS; which will complete the Triangle LMN.



3. Set

3. Set one Foot in L, and turn the other to B, and describe the Arch BCP; lastly, set the Compasses on M, and describe ACO, so have you now completely formed the spherical Triangle ABC. Do you understand it?

TYRO. Very well, Sir. But now, how am I to measure this Triangle?

PHILO. That you will soon see: For you were told, that the Angles might be turned into Sides, and the Sides into Angles: Observe then, Let the ABC be an obtuse angled Triangle, obtuse angled at B, then will DE be the Measure DAE, because AD and AE are Quadrants (*viz.* are drawn at the Distance of the Radius itself) and therefore FG will be the Measure of the acute Angle FBG, the Complement of the Angle B, and ACP is its Supplement; for P is not only  $\equiv B$ , but all other Sides and Angles are Complements of the Triangle ABC. Thus the Side CP is the Complement of BC to a semi-circle.

4. Let KI be the Measure of the Angle at C; then  $MN \equiv ED$ , because ME and ND are Quadrants, and their common Complement is NE.

5. The Side LN is  $\equiv FG$ , because NF and LG are Quadrants, and their common Complement is NG.

6. Again, LM is  $\equiv KI$ , for KL and MI are Quadrants, and their common Complement is the Arch MK.

Thus it appears evident, that the Sides of the Triangle LMN are equal to the Angles of the Triangle ABC, taking for the greatest Angle ABC its Complement, *viz.* the Angle DBE; and so by the same Rule the Sides or the Triangle ABC are equal to the Angles of the Triangle LMN; for the Side AC is  $\equiv EI$ , and EI is the Measure of the Angle HKM, the Complement of the obtuse Angle LMN. Again,

7. The Side AB is  $\equiv RQ$ ; now RQ is the Measure of the Angle MNL; and lastly BC is  $\equiv KG$ , which is the Measure of the Angle at L; for AE and CI are Quadrants; so are AQ and BR; BC and CK; and CE, AR, and CG are Complements of their Archs respectively:

Therefore the Sides of a spherical Triangle may be changed into Angles, and the Angles into Sides (*Q. E. D.*) which was to be proved.

#### OBSERVATION I.

All Sides that are equal to a Quadrant (or Radius) are called quadrantal; therefore, in the foregoing Figure, ND, NQ, NR, NS, &c. are Quadrantals, being equal to the Radius of the Circle itself every where, or being equal to the Sine of  $90^\circ$ , Chord of  $60^\circ$ , or Tangent of  $45^\circ$ , as was said before in plain Trigonometry.

OBSER-

## OBSERVATION II.

In *plain Trigonometry*, if two Angles are known, the third is also known, being the Complement to  $180^\circ$ ; but it is not so in *Spherical Trigonometry*, because the three Angles of a Spherical Triangle are greater than two right ones.

## OBSERVATION III.

Where the Sides of a Triangle are all *Quadrantal*, and the Angles right, 'tis then called a *Quadrantal Triangle*, as *KLC* in the foregoing Figure.

TYRO. I heartily thank you, Sir. Now I should be glad you would give me some Instructions in measuring the Sides and Angles.

PHILO. I will, but it must be very short and concise, therefore your Application must be greater.

TYRO. Please to give me an Example or two by working some Problems at large.

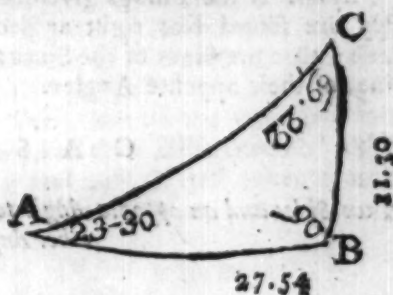
PHILO. The Way and Manner of working a Problem here, being the same in *plain Trigonometry*; I shall give you only one Example, having Room for no more, and by the Help of the following Table, you may work the rest at Leisure.

## S E C T. VIII.

*Of the Sixteen Cases of right angled Spherical Triangles*

## C A S E I.

The Side *AB* ( $27^\circ 54'$ ) and the Angle at *A*  $23^\circ 30'$  being given, to find the Perpendicular or Side *BC*. Then



As Radius or Sine of  $90$   
To the S of the Side *AB*  $27.54$   
So is the T of the  $\angle$  *A*  $23.30$

10.  
9.67018  
9.63830  
—

To the Side *BC*  $11.30$

9.30848

And so on for any of the other Sides as in the following Table.

T.

A SY-





As the S of Side BC  $38^{\circ} 30'$ , - - 9.794149  
 To S  $\sphericalangle$  A  $30^{\circ} 28'$ , - - - 9.705040 } add  
 So is S of Side AC  $70^{\circ}$  - - - 9.972986

To S or Sc of the  $\sphericalangle$  B.

From this - - - 19.678026

Take the Top Logarithm, and there will remain 9.883877

The Logarithm answering to the Sine of  $49^{\circ} 57'$ , whose Complement to  $180^{\circ}$  is  $130^{\circ} 3'$  = the  $\sphericalangle$  at B as by the Figure. And thus for all the rest.

C A S E II. Fig. 1.

Two Angles, viz. B  $130^{\circ} 3'$ , C  $31^{\circ} 34'$ , and the Side AC 70, being given; to find the Side AB.

Analogy. As the S of  $\sphericalangle$  B  $130^{\circ} 3'$  : S of the Side AC  $70^{\circ}$  :: S of  $\sphericalangle$  at C  $31^{\circ} 34'$  : S of the Side AB  $40^{\circ}$ .

C A S E III. Fig. 1.

Two Sides, viz. AC  $70^{\circ}$ , and AB  $40^{\circ}$ , with the  $\sphericalangle$  A  $30^{\circ} 28'$  being given; to find the  $\sphericalangle$ 's at B and C.

R U L E I.

1. Add the Sides AC and AB together, and take the  $\frac{1}{2}$  of it, which is  $55^{\circ}$ ; also take  $\frac{1}{2}$  the Difference of AB, and of AC, viz.  $15^{\circ}$ , as also  $\frac{1}{2}$  the Angle A, viz.  $15^{\circ} 14'$ . Then, as S of  $\frac{1}{2}$  the Sum of the Sides AC and AB, (viz.  $55^{\circ}$ ) : the S of  $\frac{1}{2}$  the Difference  $15^{\circ}$  :: Tc of  $\frac{1}{2}$  the  $\sphericalangle$  A, viz.  $15^{\circ} 14'$  : T of  $\frac{1}{2}$  the Difference of the  $\sphericalangle$ 's B and C  $49^{\circ} 14' 30''$ .

Again,

2. As the Sc of  $\frac{1}{2}$  Sum of Sides AC and AB, viz.  $55^{\circ}$ , : Sc of  $\frac{1}{2}$  their Difference  $15^{\circ}$ . :: Tc of  $\frac{1}{2}$   $\sphericalangle$  at A  $15^{\circ} 14'$  : T of  $\frac{1}{2}$  the Sum of the  $\sphericalangle$ 's B and C  $80^{\circ} 48' 30''$ .

3. Add the  $\frac{1}{2}$  Sum of the Difference of the unknown  $\sphericalangle$ 's B and C  $49^{\circ} 14' 30''$  to the  $\frac{1}{2}$  Sum of their Difference  $80^{\circ} 48' 30''$ , it gives  $130^{\circ}$ ,  $3'$  the  $\sphericalangle$  at B; and  $49^{\circ} 48' 30''$  taken from  $80^{\circ} 48' 30''$ , gives the  $\sphericalangle$  C =  $31^{\circ} 34'$ , as above.

C A S E IV. Fig. 1.

Two Angles, viz. A  $30^{\circ} 28'$ , and B  $130^{\circ} 3'$ , and their interjacent Side AB  $40^{\circ}$  being given; to find the other Side BC and AC.

Take the Sum and Difference of the two Angles, and you will find the Sum  $160^{\circ} 31'$ , whose  $\frac{1}{2}$  is  $80^{\circ} 15' 30''$ . Their Difference  $99^{\circ} 35'$ ; whose  $\frac{1}{2}$  is  $49^{\circ} 47' 30''$ . The Side AB is  $40^{\circ}$ , whose  $\frac{1}{2}$  is  $20^{\circ}$ .

T 2

Then

Then the Analogy is,

1. As S of  $\frac{1}{2}$  the Sum of the  $\nabla$ 's A and B,  $80^{\circ} 15' 30''$  : S of  $\frac{1}{2}$  their Difference  $49^{\circ} 47' 30''$  :: T of  $\frac{1}{2}$  the Side AB  $20^{\circ}$  : T of  $\frac{1}{2}$  the Difference BC and AC  $15^{\circ} 45'$ . Or,

2. As the Sc of  $\frac{1}{2}$  Sum of the  $\nabla$ 's A and B  $80^{\circ} 15' 30''$ , to Sc of  $\frac{1}{2}$  their Difference  $49^{\circ} 47' 30''$  :: is T of  $\frac{1}{2}$  Side AB  $20$  : T of  $\frac{1}{2}$  the Sum of the Sides BC and AC, viz.  $54^{\circ} 15'$  :

3. Add therefore  $\frac{1}{2}$  the Difference of the Sides BC and AC  $15^{\circ} 45'$  to  $\frac{1}{2}$  their Sum  $54^{\circ} 15'$ , and it gives  $70$  the Side AC; but if deducted leaves the less Side BC  $38^{\circ} 30'$ .

### C A S E V. Fig. 1.

*Two Sides, viz. AC  $30^{\circ}$  and BC  $38^{\circ} 30'$ , and the Angle A  $30^{\circ} 38'$ , to find the Side AB.*

N. B. By Case the first, the  $\nabla$  B is found  $= 130^{\circ} 3'$ .

Rule. Take the  $\frac{1}{2}$  Sum of the two Angles, viz.  $160^{\circ} 31'$ , which is  $80^{\circ} 15' 30''$ , and  $\frac{1}{2}$  their Difference, which is  $49^{\circ} 47' 30''$ , and  $\frac{1}{2}$  the Difference of the Sides, which is  $15^{\circ} 45'$ . Then,

As the S of  $\frac{1}{2}$  Difference of the  $\nabla$ 's B and A  $49^{\circ} 47' 30''$  : the S of  $\frac{1}{2}$  their Sum  $80^{\circ} 15'$  :: the T of  $\frac{1}{2}$  Difference of the Sides AC and BC : T of  $\frac{1}{2}$  the Side AB  $20^{\circ}$ , which doubled gives  $40^{\circ}$  the Side AB.

### C A S E VI. Fig. 1.

*Two Angles, viz. A  $30^{\circ} 28'$ , B  $130^{\circ} 3'$ , and the Side AC  $= 70^{\circ}$  being given; to find the Angle at C.*

N. B. First, by Case 2, find the Side BC  $= 38^{\circ} 30'$ .

1. Add the Sides AC and BC together, they make  $108^{\circ} 30'$ , whose  $\frac{1}{2}$  is  $54^{\circ} 15'$ ; the Difference of the Sides is  $31^{\circ} 30'$ , whose  $\frac{1}{2}$  is  $15^{\circ} 45'$ .

2. The Difference of the  $\nabla$ 's B and A is  $99^{\circ} 15'$ , whose  $\frac{1}{2}$  is  $49^{\circ} 47' 30''$ . Then the Proportion is

As the S of  $\frac{1}{2}$  the Difference of the Sides BC and AC  $15^{\circ} 45'$  :  $\frac{1}{2}$  the Sum of the Sides of BC and AC  $54^{\circ} 15'$  :: T of  $\frac{1}{2}$  the Difference of the  $\nabla$ 's B and A  $49^{\circ} 47' 30''$  : T of  $\frac{1}{2}$  the  $\nabla$  at C  $15^{\circ} 47'$ ; whose Double is  $31^{\circ} 34'$ , the  $\nabla$  at C required.

### C A S E VII. Fig. 1.

*Two Sides, AC  $70$  and BC  $38^{\circ} 30'$ , and the opposite Angle A  $30^{\circ} 28'$  being given; to find the Angle C.*

First, By Case 1. I find the  $\nabla$  at B  $130^{\circ} 3'$ .

1. The Difference of the Angles B and A is  $99^{\circ} 35'$ , whose  $\frac{1}{2}$  is  $49^{\circ} 47' 30''$ .

2. The Sum of the Sides AC and BC is  $108^{\circ} 30'$ , whose  $\frac{1}{2}$  is  $54^{\circ} 15'$ ; their Difference is  $31^{\circ} 30'$ , whose  $\frac{1}{2}$  is  $15^{\circ} 45'$ . Then,

3. As S of  $\frac{1}{2}$  Difference of the Sides, viz.  $15^{\circ} 45'$  : S of  $\frac{1}{2}$  the Sum of the Sides  $54^{\circ} 15'$  :: T of  $\frac{1}{2}$  the Difference of the  $\nabla$ 's

B

B and A, viz.  $49^{\circ} 47' 30''$  : Tc of  $\frac{1}{2}$  the  $\nabla$  at C  $15^{\circ} 47'$ , which doubled gives  $31^{\circ} 34'$ .

C A S E VIII. Fig. 1.

Two Angles, viz. C  $31^{\circ} 34'$ , and B  $130^{\circ} 3'$ , and the opposite Side AC  $70^{\circ}$  given; to find the Side BC.

First, I find the Side AB (by Case 2.) to be  $40^{\circ}$ .

1. The Sum of the 2  $\nabla$ 's B and C is  $161^{\circ} 37'$ , whose  $\frac{1}{2}$  is  $80^{\circ} 48' 30''$ ; their Difference is  $98^{\circ} 29'$ , whose  $\frac{1}{2}$  is  $49^{\circ} 14' 30''$ .

2. The Difference of the Sides AB and AC is  $30^{\circ}$ , whose  $\frac{1}{2}$  is  $15^{\circ}$ . Now,

As S of  $\frac{1}{2}$  the Difference of the  $\nabla$ 's B and C  $49^{\circ} 14' 30''$  : S of  $\frac{1}{2}$  S of the said  $\nabla$ 's  $80^{\circ} 48' 30''$  :: T of  $\frac{1}{2}$  the Difference of the Sides AB and AC, viz.  $15^{\circ}$  : T of  $\frac{1}{2}$  Side BC  $19^{\circ} 15'$ , which doubled gives  $38^{\circ} 30'$ , the Side BC.

C A S E IX.

In the Triangle ABC, let there be two Sides, CB  $38^{\circ} 30'$ , and AC  $70'$ , and the Angle C  $31^{\circ} 34'$ ; to find the Side AB.

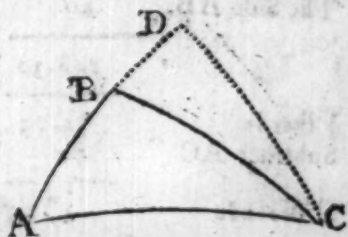
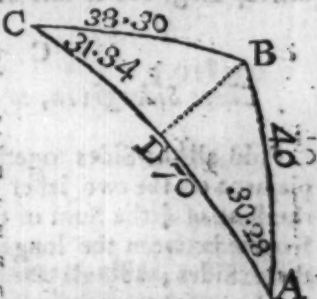
This is done two Ways, either by letting fall a Perpendicular within or without the Triangle.

1. Let fall the Perpendicular BD, which will divide the Triangle ABC into two Rectangulars ADB and BDC; then may the Side AB be found as follows. As Rad. : Sc of the included  $\nabla$  C :: T of the less Side CB  $38^{\circ} 30'$  : T of a 4th Arch  $34^{\circ} 8'$ , (which remember to reserve) whose Complement to  $90^{\circ}$  is  $35^{\circ} 52'$ , called the residual Arch.

2. As Sc of this 4th Arch  $34^{\circ} 8'$  : Sc of the residual Arch  $35^{\circ} 52'$  :: Sc of the less Side CB  $38^{\circ} 30'$  : Sc of the Side AB  $40^{\circ}$ , as required.

3. N. B. That the Perpendicular may and will often happen to fall without the Triangle, as in Figure 3d annexed. Then must the Sides of the original Triangle be continued to make two Rectangulars, the one being included in the other, as in the Triangle ABC,

in which the Perpendicular let fall will be DC falling from C on the Side AB continued, and forming the two Rectangulars BDC and ADC; and therefore the Side BC may be found as in the former Directions.





N. B. If the  $\nabla$ 's at the Base be both of one Kind or Name; the Perpendicular will then fall within the Triangle; but if the  $\nabla$ 's are different, it will fall without the Triangle.

## C A S E X. Fig. 2.

Two Angles, C  $31^{\circ} 34'$ , B  $130^{\circ} 3'$ , and the Side CB  $38^{\circ} 30'$  being given, to find the Angle at A.

N. B. See Fig. 1. and 2.

1. Divide the oblique Triangle ABC into two rectangled Triangles by the Perpendicular BD; this will make two different Triangles CBD and DBA, whose Angle CBD is  $64^{\circ} 19'$ , and the Angle ABD  $= 65^{\circ} 44'$ . Now the Angle at A is thus found.

As the S of the  $\nabla$  CBD  $= 64^{\circ} 19'$  - Log. 9.954823

To the S of the  $\angle$  ABD  $65^{\circ} 44'$  - - 9.959824 } add  
So is the Sc of the  $\angle$  C  $31^{\circ} 34'$  - - 9.930456

To the Log. of the  $\angle$  at A (first taking - 19.890280  
the top Log. out of this Sum) viz.  $38^{\circ} 30'$  - 9.935457.

## C A S E XI.

Three Sides given, to find the Obtuse or oblique Angle B.

## R U L E.

Add all the Sides together; then take the Arithmetical Complement of the two lesser Sides (which here is CB and AB) and the Sine of  $\frac{1}{2}$  the Sum of the Sides; and also the Sine of the Difference between the longest Side and the Half of the Sum of the three Sides; add all these four together, and take the Half of the Logarithm of their Sum; the Logarithm that remains will be  $\frac{1}{2}$  the Angle (B) required.

See the Work.

The Side AC	$70^{\circ}$		Co. Arith.
The Side CB	$38.30'$	- - -	0.191933
The Side AB	$40$	- - -	0.205850
	<hr/>		
	148.30		
	<hr/>		
$\frac{1}{2}$ this is	74.15	- - -	Sine 9.983380
Subtract AC	$70$	- - -	
	<hr/>		
Difference	$4^{\circ} 15'$	- - -	Sine 8.869868

Sum 19.251031  
9.625515

The  $\frac{1}{2}$  of this is - - -  
This Logarithm 9.625515 answers to  $65^{\circ} 1' 30''$ , which doubled gives  $130^{\circ} 3'$  the  $\angle$  at B required.

TYRO.

TYRO. I thank you very kindly, *Philomathes*, for this Demonstration.

PHILO. It is difficult, no doubt, to be apprehended by a few Words only; and you are also to take Notice, that this Operation helps you to find the Beginning and End of Twilight; likewise the Variation of the Needle; the Sun's Azimuth, the Declination of a Wall, or any Plane in Dialling.

CASE XII.

The three Angles,  $A 30^{\circ} 28'$ ,  $B 130^{\circ} 3'$ , and  $C 31^{\circ} 34'$ , being given, to find the Side AB.

N. B. See the Fig. 1. 2.

This Case is performed like the last, by converting the Angles into Sides, or the Sides into Angles.

For let the $\angle C = 31^{\circ} 34' 26''$ ,	Co. Arith.
Angle at A = $30^{\circ} 28' 11''$ ,	0.294920
Complement $\angle B$ ,	
To $180^{\circ}$ ,	49.56.49,

Sum, 111.59.26

$\frac{1}{2}$ this Sum	-	55.59.43,	Sine	-	9.918549
From this take $\angle C$		31.34.26			

Difference	-	24.25.17,	Sine	-	9.616417
------------	---	-----------	------	---	----------

Sum	-	19.945970
-----	---	-----------

Whose  $\frac{1}{2}$  Sum is

Which is the Sc of 20, which doubled gives the Side AB = 40.

N. B. If the greater Side AC were required, then the Operation would produce the Complement thereof to a Semi-circle, or  $180^{\circ}$ ; therefore by subtracting it from  $180^{\circ}$ , you would have the Side AC.

## DIALOGUE III.

## Of ASTRONOMY.

## SECT. I.

TYRO. WHAT do you mean by Astronomy?

PHILO. Astronomy is that Part of the Mathematics that teaches us the System of the Universe, by discovering the Motions, Magnitudes, and Distances of the heavenly Bodies; together with their Revolutions, Rising, and Setting, the Cause of Eclipses, and the true Time when such Eclipses will happen, &c.

TYRO. How many Systems are there?

PHILO. Eight in all; but as the first seven, by Reason of making the Earth in the Centre, and other Bodies involving or rolling it with eccentric and solid Orbs, and such like ridiculous Stuff, we shall take no further Notice of them, than only by saying, they are now set aside, and the *Copernican* System only allowed of, as being consistent to Truth, and agreeable to the common Capacity of Mankind, by undeniable Demonstrations.

PHILO. Why is it called the *Copernican* System?

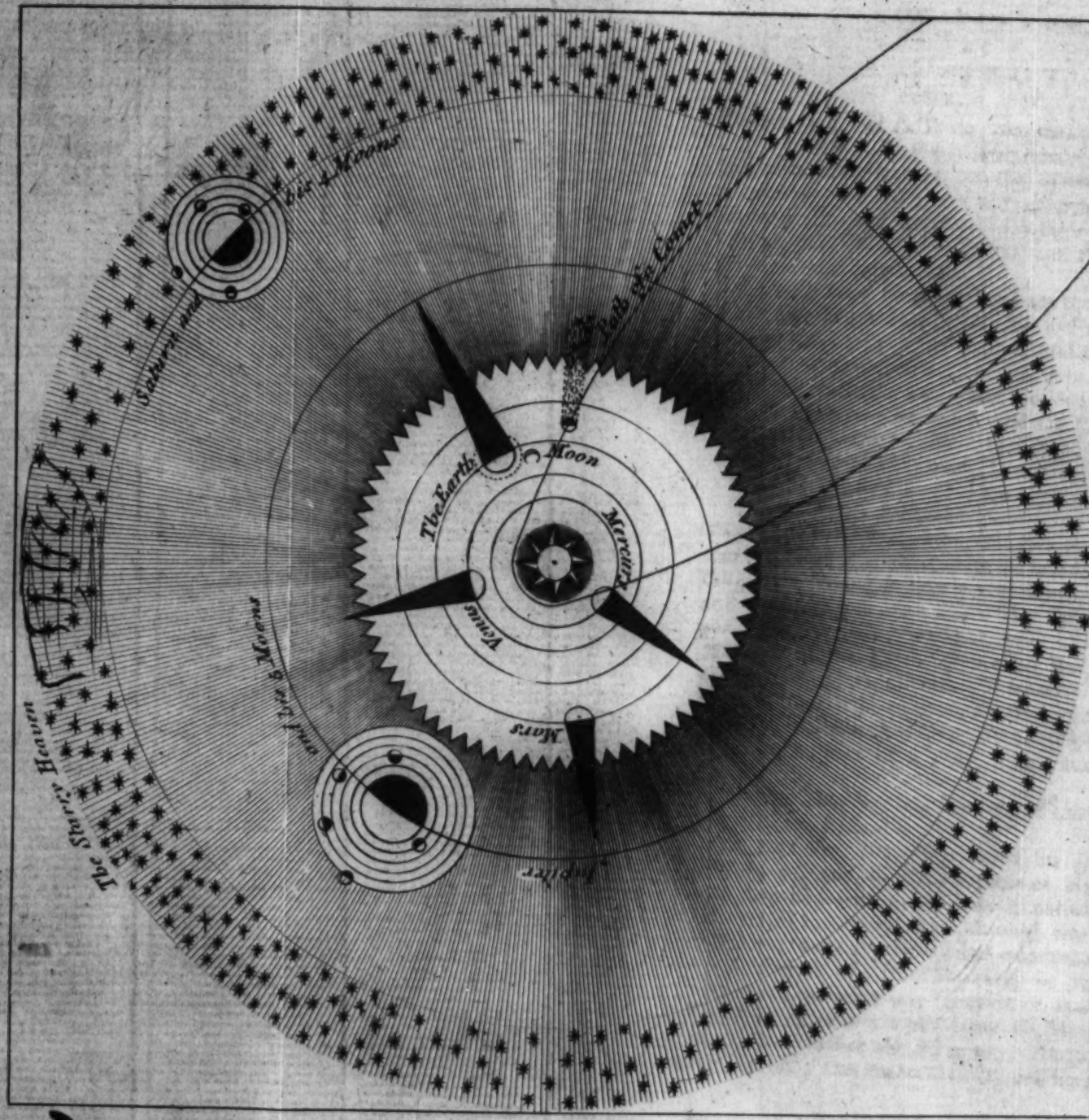
TYRO. From *Nicholas Copernicus* of *Thorn* in *Prussia*, in the Year 1473; he being the great Reviver or Improver of this System; though it is asserted by the best Historians, that *Pythagoras* taught the same (or nearly the same) 540 Years before Christ, and therefore it is often called the *Pythagorean* System. *Pythagoras*, it is plain, was not quite clear in respect to the true Motions of the Earth, and other Bodies round the Sun; but *Copernicus*, by Application, discovered evidently the two Motions of the Earth, *viz.* one round its own Axis in twenty-four Hours, (which makes Day and Night) and the other round the Sun in the Space of a Year, which occasions the various Seasons.

TYRO. Has no-body since that Time made further Improvements in this System?

PHILO. Yes, the unparalleled *Sir Isaac Newton*, the Glory of *England*, and the Master-piece of Nature. This great Man was favoured with more than a natural Genius, and Heaven vouchsafed to convey to us through this Channel many things unknown to the Ancients, and which there is not sufficient Room here to treat of: But however, he regulated and completed whatever *Copernicus* was ignorant of. — He discovered the just Laws of Gravitation of Matter to Matter, or of one Body to another, by which the Accuracy, Harmony, and Agreement of the Heavenly Bodies are seen by one simple Principle, and their  
amazing



THE  
COPERNICAN or SOLAR SYSTEM.





# A T A B L E of the Six Primary Planets, with their Affections, &c.

	SATURN	JUPITER.	MARS.	EARTH.	VENUS.	MERC.
Their Diameter in English Miles,	678701	811551	44441	79641	79061	2460
Their Circumference,	2131'21"	2408081	139501	745201	248231	7710
Their Superficies in square Miles,	144684300001	26880000001	620320001	1992502051	1962380001	1902804
Their Magnitude in cubic Miles,	1636377000000012810423000000001	459566000001264467890701	2584459000001	7793273000		
Their mean Distance from the Sun in Miles,	777007001	4240000001	1230000001	81000007	59000001	32000000
The Diameter of their Orbs in Miles,	15540000001	8480000001	2460000001	162000001	118000001	64000000
The Circumference of their Orbs,	28318910001	2662800001	7736860001	508991001	3706360001	201024070
Their daily Revolution round their Axes,	— — — —	9 h. 56' 1 d. 0 h. 40'	23 h. 6'	23 h. 0'	— — —	— — —
Their periodical Times,	10759 d. 6 h. 36'	433 d. 12 h. 20' 686 d. 23 h. 27'	365 d. 6 h. 9'	224 d. 16 h. 49'	87 d. 23 h. 16'	
Daily mean Motion in the Ecliptic,	— 2 — 00'	4' 59"	31' 27"	59' 8"	10 36' 8"	40 51' 30"
Inclination of their Orbits to the Ecliptic,	20 30' 0"	10 20' 0"	10 52' 0"	— — —	3 24' 0"	6 54' 0"
Proportion of their Bulks,	621351	1064501	1701	10001	9851	30
Proportion of Light and Heat,	1 1/21	31 1/21	41	1001	200	700

[To face Sect. II. of the Copernican System, P. 213.]

amazing Revolutions and Velocities round the Sun, as their common Center, easily accounted for, and the Power and Wisdom of the *Great Architect* (in some small Measure) at the same time is beheld by Man to an astonishing Pitch of Admiration, in order to humble him, and duly to consider the infinite Disproportion between the Creature and Creator.

## S E C T. II.

*Of the Copernican System, or the Doctrine of the Sun and the six primary Planets.*

TYRO. Pray, kind *Philo*, give me some Account of the Sun, and some other of the heavenly Bodies.

PHILO. I will, as far as Room will allow of, and first we will speak of that huge and glorious Body of Light the Sun.

TYRO. What do you mean by calling it a *huge* Body; it appears to me to be but very small.

PHILO. No matter how it may appear to the naked Eye; plain it is, that the Sun is so vastly large above the Globe of the Earth, that it will hardly bear any Comparison; it being very little less than 1000000 (*viz.* a Million) times larger; for its Diameter is computed to be 822148 Miles, and its Bulk not less than (2909710000000000 Miles) 2 hundred and 90 thousand, 971 Millions of Millions of solid Miles.

TYRO. Very surprizing, and almost incredible!

PHILO. It is quite so to Persons who know nothing of the Nature of Angles and Circles, and they naturally think that you are imposing upon them, and asserting Falsties: But however, as Ignorance and Obstinacy are inseparable Companions, if at any time you meet with such as will not give Credit to these Things, be not too rash with them, but reason calmly, and let them know that this Distance is even as nothing in Comparison to the Distance of the fixed Stars; and therefore there is little Cause to wonder at such an Assertion; and much less, would they truly consider the infinite Power and Wisdom of the heavenly Architect.

TYRO. Very true, Sir; but there are many Persons as well as myself, that may be very ready to believe this; but yet would like to know how to prove it, or see it demonstrated.

PHILO. No doubt of it; and I am sensible that you will allow, that when the Diameter of any Circle or Body is known, the Area and Solidity are easily found; and it is well known, that 'tis as easy to tell the Distances, and Bulks of any Bodies, when we know the different Times of their Motions round different Circles, having one Center; or (which is more natural and easy) by comparing the apparent Diameter of any distant Object with the real Diameter of the Image thereof, by imaginary Lines drawn from the extreme Parts of the one to the extreme.

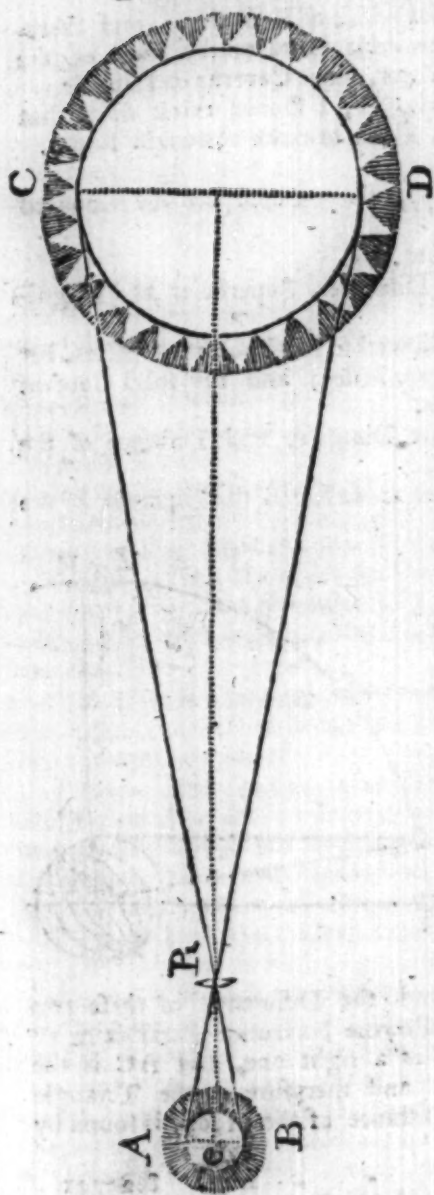
treme Parts of the other, &c. — Do you understand this?

TYRO. I can't say I do as yet; and therefore beg if you can, to demonstrate it by some Figure.

PHILO. That I will with all my Heart. And I think if you do but mind the Nature and Design of the following Figure, and well observe the Comparison of the two Objects, you will soon see it is not so difficult to understand as you imagined. — Observe then,

1. Take a double Convex Glass (or Lens), let there be a small Hole as at R; place this Lens in the Window-shutter of a darkened Room; this being done, fix a Sheet of Paper at any proper Distance, according to the Size of the Room, (suppose from 10, 12, or more Feet from the Lens) and you will find two Rays of Light passing from the Extremity of the Body of the Sun CD, through the Lens R, making the Lines CRB, and DRA; which will form an Image of the Sun itself, whose Diameter will be AB, and in Proportion therewith from the Distance of the Lens.

2dly. But though this Proportion holds good always, yet the Work will vary according to the Distance of the Lens from the Image; but let us suppose the focal Distance  $RA = RB$  to be 12 Feet or 144 Inches, then by carefully measuring the Diameter of the Image AB (if the Hole of the Lens be of a proper Size) will be one Inch  $34$  Parts, whose Semi-Diameter  $eB$  or  $eA$ , 0.67 Parts,



3dly. Then it will be,  
As RA or RB 144 :  $\frac{1}{2}$  the  
Diameter AB, *viz.* e A  
or e B 0.67 Parts :: Ra-  
dius : to the Line of the  $\angle$   
e RA, or e RB 16 ; and  
therefore the  $\angle$  ARB will  
be  $32' =$  to the Diameter  
of the Image, or the appa-  
rent Diameter AB. There-  
fore,

4thly, The Proportion  
will be thus, in order to  
find the Diameter.

As the Distance of the  
Image, *viz.* RA to its  
Diameter ; so is the given  
Distance of the Sun's  
(*viz.* 82136014 Miles)  
to his Diameter, which in  
this Case will be 764320  
Miles ; which is less than  
is computed by many  
thousand Miles, but not-  
withstanding this it is so  
trifling, that it produces  
no Error, nor makes  
any sensible Difference in  
calculating Eclipses in ge-  
neral.

TYRO. I thank you,  
dear PHILO ; and now  
pray give me a little Ac-  
count of the Moon.

PHILO. I will.

### SECT. III.

#### *Of the Moon.*

TYRO. What do you apprehend the Moon to be ?

PHILO. The Moon is allowed to be a dark spherical Body,  
like to the Earth in Matter and Form, and borrows her Light  
from the Sun by Reflexion, shining upon that Part, or those  
Parts of the Surface that consists of Hills, Mountains or plain  
Land;





3982 = 22008.5 $\frac{1}{2}$  Miles her nearest Distance CB; by the same Rule you may find the Side AB her Distance from the Center of the Earth to be 220344  $\frac{78}{100}$  Miles.

*To find her Diameter.*

Let Z be the Moon, and o her Center, draw Ao and AE, and oE will be her apparent Semi-Diameter at the Center of the Earth, and the Angle EAo 16' 52". Therefore,

As the Sine of the $\angle$ AEo 89° 43' 8"	-	-	9.99995
To the Side AO = 220344.78 Miles	-	-	5.34261
So is the S of the $\angle$ EAo 16' 52"	-	-	7.69066

So the Side or Semi-Diameter Eo 1079.6 - 3.03327  
This  $\times 2$  is = 2159  $\frac{2}{10}$  Miles the Diameter itself, which is very near Truth.

TYRO. I heartily thank you, Sir; but pray, does the Moon move round her own Axis, and round the Earth; as the Earth does round her Axis and round the Sun?

PHILO. Yes, she does, for she is called the Earth's *Satellite*, or Attendant, being a secondary Planet appointed by the Law of Nature to attend upon the Earth in its annual Course round the Sun.

TYRO. But you said just now, that the Moon moves round the Earth, as well as round her own Axis; pray in what Time does she perform this?

PHILO. Both in the same Space of Time; for she revolves about her Axis in 27 Days, 7 Hours, 43 Minutes; and also round the Earth in the same Time.

TYRO. This is a Mystery to me at present, but I suppose there is no Certainty of what you assert.

PHILO. It is very evident it cannot be otherwise.

TYRO. Why so?

PHILO. Because we see the same Face, Figure, or Side of the Moon at the same Times, or Spaces of Times from one New Moon to another; which never could happen, unless by her periodical Motion (*viz.* in her whole Revolution) she turned so much of her Body from the Earth, as is turn'd towards the Earth by her daily Motion round her own Axis.

TYRO. I apprehend it now very clearly: But pray, Sir, let me ask what the Form of the Moon's Orbit is?

PHILO. Her Orbit is elliptical; but so irregular is the Motion, that she is by this means perpetually changing both her Place, and Figure.

TYRO. From what does this proceed?

PHILO. From the Excentricity of her Orb, and the Obliquity, Crookedness or Irregularity of her Axis in her diurnal Motion in the Ecliptic.

TYRO. Why does not the Moon move regularly in the Ecliptic then?

PHILO. No, for if she did you would find an Eclipse of the Sun every Conjunction, or every New Moon.

TYRO. Then I perceive that she does not move directly in the Plane of the Ecliptic.

PHILO. You are right; for she makes an Angle therewith of about  $5^{\circ} 17' 20''$ , by two Intersections, in 2 Points exactly opposite to each other, called *Nodes*: This ( $\Omega$ ) is called the Dragon's Head, or ascending Node, it being that Point of the Ecliptic, which the Moon intersects when she passes out of South into North Latitude; and this ( $\oslash$ ) is called the Dragon's Tail, being the descending Node, or Point that she intersects passing from North into South Latitude.

TYRO. Pray have these Nodes any Motion?

PHILO. Yes, they have a Diurnal Motion of about  $3' 11''$ , and that contrary to the Order of the Signs themselves; but more of this when we come to speak of Eclipses.

TYRO. I'm obliged to you, Sir; but pray what is the Reason we see the Moon rise or set about an Hour later every Night than it did the Night before; is this owing to any particular Motion?

PHILO. Yes, from a diurnal Motion of about  $13^{\circ} 10'$ , from West to East round her Orbit, which, together with the Motion of the Earth round her Orbit, makes very near an Hour's Difference of rising and setting one Night with another, according to vulgar Computation, but it is not so every Night, being sometimes as much again as at others, according to the different Times of the Year, and the different Parts of the Ecliptic, that the Earth and Moon may then happen to be in; which different Positions will in Course make different Aspects in both at certain Times; as is evident from the different Aspect of the Moon towards the Autumn, vulgarly called the Harvest Moon, which looks larger than at other Times, and does not set the next Night after full, but rises about the same Time for several Nights together.

TYRO. I'm glad you mentioned this, because I know many Persons as well as myself are ignorant of the Reason why it appears so at this Time. Be so kind therefore to give me some further Account of it.

PHILO. You will soon see the Reason, if you will but attend to the following Observations.

1. In all oblique Spheres, every great Circle intersecting the Horizon must in the Revolution cut or intersect the Horizon in different Parts and at different Angles.

2. When the Sign *Libra* rises in the East Point, the Ecliptic then makes a much greater Angle with the Horizon, than when *Aries* rises orient or in the East, and when *Capricorn* rises orient, then

then the Ecliptic cuts the Horizon in an Angle, which is a Mean between the other two.

3. Hence it is, that when the Moon is at the Full in, or about Libra, she will then be deprest'd the lowest under the Horizon, and in or near Aries least of all; consequently therefore the Difference of her rising at, or towards the Autumnal Equinox will be less for several Nights together, than towards the Vernal Equinox.

4. When the Nodes shall happen to be in or near the Equinoxes, a Full Moon then that happens in the Beginning of Libra, will not rise the next Night for upwards of one Hour and a Quarter after the Time she rose the Night before, and so on nearly for several Nights together. But,

5. Should the Moon at this Time be in Perigium, (*viz.* or at her nearest Distance from us) then the Intervals of her rising will be greater in Spring than in Autumn.

6. Thus it is plain the Autumnal or Harvest Moon (*viz.* the Full Moon before the 21st of September) rises with less Intervals, or with much less Difference Night after Night, than the vernal Full Moon, or that which happens before or nearest the 21st of March, as may be seen in a common Almanack of any Date, but more particularly by the following Table.

A TABLE of the nightly Difference of the rising of the Vernal and Autumnal Full Moon, for the Year 1760, &c.

Full Moon, March 1st.			Full Moon, Aug. 26.		
Day	rises	Difference	Day	rises	Difference
2	6 h. 8'	h. m.	27	7. 53	h. m.
3	7. 19	1. 11	28	8. 11	0. 18
4	8. 30	1. 11	29	8. 28	0. 17
5	9. 38	1. 8	30	8. 46	0. 18
6	10. 47	1. 9	31	9. 8	0. 22

TYRO. I am highly obliged to you, kind *Philomathes*, and am now quite satisfied it is so; but now I don't know the Reason why it rises sooner at one Time than at another.

PHILO. You have been told Part of the Reason already; but however the chief Reason of the Difference is, that at one Time the Moon cuts the Horizon nearer to right Angles at rising than at the other Time, and consequently is longer before she appears above the Horizon.

TYRO. I humbly thank you, Sir, and am now very clear in what you have shewn me.

PHILO. Then I am ready to answer you in what you shall farther ask.

TYRO. I should be glad then, Sir, to know something concerning



cerning *New* and *Full Moon*, the Reason of her appearing in such various Aspects, and also to be instructed a little concerning Eclipses, of which I have very little Notion at present.

PHILO. Any thing, my dear *Tyro*, that I can serve you in, you are welcome to; but you must expect but a small Hint of these Things; which therefore requires your greater Attention and Application. However, my Opinion is, that you ought first to understand the Meaning of several Words and Phrases previous to the better understanding of what we shall hereafter treat upon.

TYRO. Sir, you are very kind, and I am sensible of the Necessity of what you say.

PHILO. Then we will proceed to

#### S E C T. IV.

*An Explanation of several things necessary to the Knowledge of Astronomy, &c.*

TYRO. What do you mean by a periodical Month?

PHILO. The Time that the Moon moves from, or to her Course from any Point of the Zodiack to the same Point, which is about 27 Days, 7 Hours, 43 Minutes.

TYRO. What is a Synodical Month?

PHILO. Exactly the twelfth Part of a Year, or the Time the Sun is passing through one Sign of the Zodiack, being about 30 Days, 10 Hours, 30 Minutes, which is also called an Astronomical Month.

TYRO. What is the Difference between this and a Lunar Synodical Month?

PHILO. A Lunar Synodical Month is the Time or Space between two Conjunctions with the Sun, or from one New Moon to another, being about 29 Days, 12 Hours, 44 Minutes\*.

TYRO. What do you mean by an Illuminative Month?

PHILO. That Space of Time from the Beginning of the New Moon's shining till she disappears again, being about 26  $\frac{1}{2}$  Days.

TYRO. What is a Lunation?

PHILO. The same as a Lunar Synodical Month.

TYRO. What is a Lunar Year?

PHILO. It contains 12 Lunations or Synodical Months, viz. about 354 Days, 8 Hours, 48 Minutes, 38 Sec. viz. 29 Days, 12h. 44' 3" 11"  $\times$  12, nearly.

\* Note. This is a mean Synodical Month; for you must observe every Synodical Month is not quite equal; for about the Summer Solstice the Sun moves much slower than in Winter; and the Synodical Month is then but 29 Days, 6 Hours, 42 Minutes; but in Winter it is 29 Days, 19 Hours, 37 Minutes.

TYRO.

TYRO. What do you mean by a Tropical or natural Year?

PHILO. It is that Space of Time in which the Sun being in any Point of the Zodiac departing therefrom, and returns to it again: Or in other Words, it is that Space of Time the Sun takes to finish his Course through the Zodiac, which is nearly 365 Days, 5 Hours, 48 Minutes, 15 Sec.

TYRO. Then I perceive there is almost 11 Days Difference between the Lunar and the Tropical Year.

PHILO. Very true, and this is what is called the Epact itself, and by Help of this the Moon's Age is found at any Time.

TYRO. Now you have mentioned the Epact, I wish you would explain this further, and also shew me how to find the Golden Number, &c.

PHILO. That I will do with all my Heart.

### S E C T. V.

*To find the Prime or Golden Number, the Epact, Cycle of the Sun, Dominical Letter, &c.*

#### I. Of the PRIME.

TYRO. What do you mean by the Prime or Golden Number?

PHILO. The Prime or Golden Number is the Cycle of the Moon, viz. a Circle, Revolution or Period of 19 Years; at the End of which the Changes of the Moon will fall upon the same Day (but upwards of an Hour sooner,) and she makes the same Aspect with the Sun, &c. as she did 19 Years before: It is said that it took its Name of Golden Number from *Julius Caesar*, who caused it to be inserted in the Calendar in Letters of Gold.

TYRO. What is the Use of the Golden-Number?

PHILO. To find the Age, and Changes of the Moon, &c.

TYRO. How is the Golden Number found?

PHILO. Add 1 to the Year of our Lord, or Date of the Year, then divide by 19, and the Remainder at last is the Golden Number. N. B. If nothing remains after the Division, then 19 itself is the Golden Number.

#### —E X A M P L E.—

I demand the Golden Number for the Years 1748, 1760, and 1785.

1748 1 add 19)1749(92 171 39 38 G. Num. 1	1760 1 add 19)1761(92 171 51 38 G. Num. 13	1785 1 add 19)1786(94 171 76 76 0 remains, therefore 19 is G. N. TYRO.
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## 2. Of the E P A C T \*.

TYRO. What is the Epact?

PHILO. The Epact is the Excess or Number of Days that the Solar exceeds the Lunar Year; the Solar being vulgarly accounted 365, and the Lunar 354 Days, the Difference is 11, which is called the Epact; thus you see one Year is 11 Days, 2 Years 22 Days, 3 Years 33 Days, &c. but 30 being accounted a whole Luration, you are to subtract 30, when it is above that Number, and the Remainder is the Epact.

TYRO. But pray give me a general Rule with an Example or two.

PHILO. 1. To find the Epact according to the Julian or Old Style.

Rule. Divide the *Golden Number* by 3; if nothing remains the Epact is the same as the Golden Number, but if 1 remains, add 10; if 2 add 20, and that will be the Epact.

2. To find the Epact according to the Gregorian or New Style.

Rule. From the Golden Number take 1; then divide the Remainder by 3, and if nothing remains, then the Epact will be the same as the Dividend, *viz.* 1 less than the Golden Number itself; but if 1 remains, add 10 to the Dividend; if 2 remains, then add 20 to the Dividend, and the Sum shall be the Epact for N. S. Thus in the last Section, the Golden Number for 1760 is 13; and for 1785, 19. Then,

$$\begin{array}{r}
 \text{G. Num. 1760} \\
 13 \\
 \text{Subtract } 1 \\
 \hline
 12 \\
 3 \overline{) 12} (4 \\
 \underline{12} \\
 0
 \end{array}$$

0 remains,  
therefore the Epact is 12.

$$\begin{array}{r}
 \text{G. N. 1785} \\
 19 \\
 \text{Subtract } 1 \\
 \hline
 18 \\
 3 \overline{) 18} (6 \\
 \underline{18} \\
 0
 \end{array}$$

0 Epact 18.

$$\begin{array}{r}
 \text{Again, 1753, G. Num. 6} \\
 \text{Subtract } 1 \\
 \hline
 5
 \end{array}$$

$$\begin{array}{r}
 3 \overline{) 5} (1 \\
 \underline{3} \\
 2
 \end{array}$$

2 remains, therefore add 20, to 5 the Dividend, it gives 25, the Epact.

\* See the Rule, Page 228.

Here follows a TABLE of 19 Epacts for the Julian and Gregorian Account, with their Golden Numbers.

G.N.	Julian Ep. O.S.	Gregorian Ep. N. S.	G.N.	Julian Ep. O.S.	Gregorian Ep. N.S.
1	11	29	11	1	20
2	22	11	12	12	1
3	3	22	13	23	12
4	14	3	14	4	23
5	25	14	15	15	4
6	6	25	16	26	15
7	17	6	17	7	26
8	28	17	18	18	7
9	9	28	19	29	18
10	20	9			

### 3. Of the CYCLE of the Sun.

TYRO. I remember you told me the Cycle of the Moon is a Revolution of 19 Years; pray what is the Cycle of the Sun?

PHILO. This is a Revolution of 28 Years, at the End of which the Dominical or Sunday Letters A B C D E F and G (which are generally placed against the Sundays in common Almanacks) return again to the same Order they were in, 28 Years before, and the 29th Year begins a new Cycle.

TYRO. I understand you in Part, but why do you use just 7 Letters, and never more or less?

PHILO. Because there are 7 Leap Years included in this Cycle; for every 4th Year you know is Leap Year, and  $7 \times 4 = 28$  the Cycle.

TYRO. I'm obliged to you; but how is the Cycle for any Year past, or to come, found?

PHILO. By the following Rule.

Add 9 to the given Year, and divide by 28, the Remainder is the Cycle.

### EXAMPLE.

For 1760

$$\begin{array}{r} 9 \\ \hline 28)1769(63 \\ 168 \\ \hline 89 \\ 84 \\ \hline 5 \end{array}$$

5 Cycle

For 1795

$$\begin{array}{r} 9 \\ \hline 28)1804(64 \\ 168 \\ \hline 114 \\ 112 \\ \hline 12 \end{array}$$

12 Cycle

TYRO.



TYRO. I understand it plainly; but pray will this Rule hold good for any Time to come?

PHILO. No longer than till the Year 1799; for every centesimal Year being a Leap Year, it is omitted, and therefore another certain Number must be added to every Year of the next, or 19th Century; and in the 20th Century another certain Number.

TYRO. By what Rule then am I to find the Cycle of the Sun for the next Century?

PHILO. As follows.

To find the Cycle of the Sun the next Century.

Add 25 to the Date of the Year (as you added 9 before) then divide by 28, and the Remainder will be the Cycle of the Sun for that Year; and this Rule stands good from 1800 to 1900.

### EXAMPLE.

For 1860

$$\begin{array}{r} 25 \\ \hline 28)1885(67 \\ 168 \\ \hline 205 \\ 196 \\ \hline \end{array}$$

9 Cycle

For 1879

$$\begin{array}{r} 25 \\ \hline 28)1904(68 \\ 168 \\ \hline 224 \\ 224 \\ \hline \end{array}$$

remains 0 therefore the Cycle is 28.

TYRO. But how is the Cycle found in the 20th Century, viz. from 1900 to 2000.

PHILO. As follows.

Rule. To the Number you added in the 19th Century (*viz.* 25) add 16 more, and from that Sum take 28, and the Remainder will be the Number to be added to the Date of the Year from 1900 to 2000. Thus,

$25 + 16 = 41 - 28 = 13$ , Number to be added in the 19th Century, &c.

Example. What is the Cycle of the Sun for 1960?

$$\begin{array}{r} 1960 \\ 13 \\ \hline 28)1973(70 \\ 196 \\ \hline \end{array}$$

13 Cycle.

TYRO. I understand the Rule very well; but will not this Method of finding the Dominical Letter after this Century, be changed as well as for finding the Cycle.

PHILO. Yes, certainly; but that will be better explained when

when we come to treat of the Dominical Letter; in the mean time, you will do well to remember, that the Years 1800, 1900, 2000, &c. being Leap Years, should have 2 Letters, according to the Old Style or Julian Account; but the Leap Year will be omitted every Century, and the Method or Rule of finding the Dominical Letter for any Time to come shall be shewn under that Head.

#### 4. Of the DOMINICAL LETTER.

TYRO. What do you mean by the Dominical Letters?

PHILO. The Dominical Letter is so called by being the Lordly Letter, or that which is placed in every common Almanack against the Lord's-Day, or *Sunday*.

TYRO. But is this *Sunday*, or Dominical Letter, always the same?

PHILO. No; there are 7 Dominical Letters answering the 7 Days of the Week, viz. A B C D E F and G; and these Letters also are used for every Month of the Year; A being set for *January*, B for *February*, C for *March*, &c. till you come to G; and then you begin with A again.

TYRO. But pray, Sir, how am I to know what Letter is to be placed or put down for any Year to come in its due Order?

PHILO. That I will shew you by and by at large; but I think it will be necessary first, to give you some further Account of the Rotation, and Retrogradation of these Letters, and the more so, because, as we keep our Reckoning now in *England* by the Gregorian Account, or New Style, the Rule for finding the Dominical Letter, according to the Julian Account or Old-Style, will not do for any Year since 1752, for the Difference being 11 Days, there are 2 different Rules to find the Dominical Letter for the same Year, according to the Style given, as you will see hereafter by an Example in each.

TYRO. What is the Occasion of the Variation of these Alphabetical Letters every Year?

PHILO. You will see the Reason, if you observe; for the common computed Year being 365 Days, and 7 Days make a Week, it is evident that dividing 365 by 7, the Quotient is 52 Weeks and 1 Day over; this 1 Day will consequently be the last Day of the Month *December*, which should be the Letter A, but this is used for *January*, as we said before.

2. Now let us suppose the Year to consist only of 364 Days, then there would be an even Number of 52 Weeks; all the Years would begin on the same Day of the Week, and each Month the same Day of the Week; but being 365 Days, the Year ends with the same Day it begins with; so in every common Year, suppose the first Day of *January* to fall upon a *Sunday*, the first Day of *January* the next Year will fall on a *Monday*, and *Sunday* will be

be the 7th Day of *January* or Letter G, and the next Year will begin on *Tuesday*, and the *Sunday* upon the 6th Day; therefore, the Dominical Letter will be F, &c.

3. But every fourth Year is called Leap Year, and consists of 366, and therefore the Order of the Dominical Letter will be interrupted, and will not return again till the End of the whole Cycle, viz. 28 Years =  $4 \times 7$ , which shews there are 7 Leap Years in the Cycle. Therefore,

4. If in a Leap Year the 1st of *January* should fall on a *Sunday*, and the Dominical Letter should be A, then the 24th of *February* will fall on a *Friday*, and the 25th on *Saturday*, and the Letter us'd for both Days will be F; and the next Day being *Sunday* will have the Letter G; so that Leap Year, you see, will have 2 Letters, one, or that first found by the Rule itself, serves from the 25th Day of *February* to the End of the Year; and the other from the 1st of *January* to the 24th of *February*.

TYRO. How do you find the Dominical Letter in general?

PHILO. By this following Rule.

Add the  $\frac{1}{4}$  Part of the Year to the given Year itself; divide that Sum by 7, and the Remainder is the Figure, which represents or shews the Golden Number according to the Order, viz. 1 is A; 2, B; 3, C; 4, D; 5, E; 6, F, and 7 is G.

N. B. If nothing remains after dividing by 7, then 7 or G is the Dominical Letter.

For  
4)1760  
440 is  $\frac{1}{4}$  add

7)2200(314  
21

10

7

30

28

remains 2

7

2

5 E, the Dom. Lett.

For  
4)1785  
446 add

7)2231(385  
21

13

7

61

56

remains 5

7

5

2 or B

Then take this Remainder 2 from 7, there remains 5 as above, which answers to E the Dominical Letter. But this Year, 1760, being a Leap Year, has 2 Dominical Letters, and therefore ought to have 2 Letters, as was observed before.

TYRO. But how am I to know these two Letters for a Certainty?

PHILO. Having found the Letters according to the Rule; that will be the *Dominical Letter*, from the 24th of *February* to the 31st of *December*, (now call'd the End of the Year) and the other

other Letter from *January* to the 24th of *February*, will be always the next Letter in Order of the Alphabet: Thus in 1760, the Dominical Letter is E, serving from *February* to *January*; then from *January* to *February* place F, so will FE be the Dominical Letters for 1760.

TYRO. Then I perceive the Letters in Leap Year, as well as in other Years, sometimes move retrograde or backwards.

PHILO. You are right, for 1776 will be a Leap Year, and you will find the Dominical Letter A, to be placed from the 24th of *February* to the End of *December*; but B is the next in Order, therefore B is from *January* to the 24th of *February*, and the 2 Dominical Letters for 1766 are BA. Do you understand me now?

TYRO. Yes, quite well; but will this Rule hold good after this Century?

PHILO. No; for the Years 1800, 1900, &c. are Leap Years, and therefore, according to the Julian Account, should have 2 Dominical Letters, but after this Century will have but one; because every centesimal Leap Year will be omitted, and the Rule altered, as it was for finding the Cycle.

TYRO. Pray give me the Rule, and an Example.

PHILO. I will.

*A Rule for finding the Dominical Letter after the Year 1800.*

I demand the Dominical Letter for 1845. Cut off 2 Figures thus, 18 | 45, divide the first 2, viz. 18, by 4 (regarding no Remainder) it makes 4, from which take 1 = 3, which taken from the original Number 18 leaves 15; this Number taken from 21, (viz. the nearest Number of Sevens, that are nearest the Number 18) leaves 6 the new Number to be added to the given Year, besides its 4th; then divide by 7, as in the old Rule, and the Remainder shall be the Figure answering the Dominical Letter as before.

$$\begin{array}{r} 4)1845 \\ \underline{461} \text{ the 4th} \\ 6 \text{ new Number} \end{array} \left. \vphantom{\begin{array}{r} 4)1845 \\ \underline{461} \text{ the 4th} \\ 6 \text{ new Number} \end{array}} \right\} \text{add}$$

$$\begin{array}{r} 7)2312(330 \\ \underline{21} \\ 21 \\ \underline{21} \\ 21 \end{array}$$

$$\begin{array}{r} 7 \\ \underline{2} \text{ remains.} \end{array}$$

5 or E the Dom. Letter.

2 remains.

Do you understand this?

TYRO. Yes, very well; but if you had not demonstrated the Rule itself, I believe I should not have easily understood it.

PHILO.



PHILO. Then I will now give you a Table of Cycles and Dominical Letters for this Century.

5. A TABLE of the Cycles of the Sun, and Dominical Letters, till the Year 1800, according to the Gregorian Account, or New Style.

1. Cycles of the Sun till 1800 N. S.

Cycles	Letters	Cycles	Letters	Cycles	Letters	Cycles	Letters
1	DC	8	B	15	G	22	E
2	B	9	AG	16	F	23	D
3	A	10	F	17	ED	24	C
4	G	11	E	18	C	25	BA
5	FE	12	D	19	B	26	C
6	D	13	CB	20	A	27	F
7	C	14	A	21	GF	28	E

To find the Gregorian Epact for ever.

Rule. Divide the Centuries of any Christian Æra by 4, (rejecting the Subsequent or odd Number) multiply the Remainder by 17; then to this Product add the Quotient, multiplied first by 43, to which add 86, and divide this last Sum by 25; then multiply the Golden Number by 11, from which subtract the last Quotient, and rejecting the Number 30 as often as you can, the Remainder will be the Epact. See Page 222.

S E C T. VI.

The Use of the foregoing Tables, &c. with some practical Exercises concerning the Change of the Moon, High-water, at any Place, &c. and the Method of finding them.

1. To tell the Moon's Age at any Time.

R U L E.

Add to the Epact for the given Year as follows, viz. for January (0), for February 2, for March 1, April 2, May 3, June 4, July 5, August 6, September 8, October 8, November 10, and December 10, and to this Sum add also the Day of the Month; if the Sum of these 3 Numbers are under 30, it gives the Moon's age, if above 30, then subtract 30, and the Remainder is the Moon's Age, and if just 30, it is New Moon some time on that Day.

E X A M P L E 1.

I would know the Moon's Age, June 20, 1757.

Epact

Epact 9 for 1757  
 Add 4 For the Month *June*  
 20 the given Day

33  
 30 subtracted

3 the Moon's Age

EXAMPLE 2.

How old, or what is the Age of the Moon, *December 11, 1761?*

Epact 23 for 1761  
 10 for the Month  
 11 the Day given

44  
 Subtracted 30

14 Moon's Age, which is the Day or nearly so that she is at the full.

2. *The Moon's Age given; to tell how many Days it will be to the Change or next New Moon.*

RULE.

Observe how many Days the Month consists of in which the preceding New Moon happened, and from the Number of Days contained in that Month, subtract the Moon's Age, and the Remainder less 1 is the Number of Days to next New Moon.

EXAMPLE.

I find by the last Example, that on *October 4, 1760*, the Moon was 24 Days old, consequently this New Moon happened in *September*; therefore,

*September* has 30 Days  
*October 4* D's Age 24 Days

6 — 1 = 5 Days to the next New Moon, viz. the 9th of *October*.

TYRO. I understand you well.

PHILO. Then we proceed.

3. *To tell the Time to full Moon.*

RULE.

Add 15 to the Days of Change, if the Sum is under 30, it gives the Number of Days to Full Moon; but if it exceeds 30, the Overplus gives the Number of Days.

X

EXAM-

## EXAMPLE.

I find by the last Example, that on the 4th of *October* the Days to change, or to the next New Moon, is 5; therefore  $5 + 15 = 20$ ; so that on the 20th of *October* the Moon will be at the full. Again, *June* the 20th, 1760, I find the Change or New Moon 22 Days, then  $22 + 15 = 37 - 30 = 7$ , so that on the 27th, it will be Full Moon.

## 4. To tell the Time of the Moon's Southing.

Rule. Multiply her Age by 4, and divide her Product by 5, and the Quotient will be the Hour, and the Remainder the fractional Parts of another Hour or the Minutes.

I demand what Time the Moon will be full South on the 21st of *April* 1761.

I find her Age to be 6 Days, therefore

$$\begin{array}{r} 6 \text{ Days} \\ 4 \\ \hline 5 \overline{)24} \end{array}$$

4  $\frac{4}{5}$  Ans. or 48 Minutes.

That is 48 Minutes past 4 in the Afternoon. Do you understand it?

TYRO. Yes, very well; and pray what have you further to observe?

PHILO. Several things more which are very useful. As,

## 5. The Time of the Moon's Southing being given to tell the Time of High-water at London Bridge.

Rule. Add 3 to the Time of her Southing, and you have very nearly the Time of High-water at *London Bridge*, rejecting 12, if it be above that Number.

Thus, by the foregoing Example, I find the Moon full South 48 Minutes past 4 in the Afternoon on *April* 21, 1761; to which if I add 3, it will be 48 Minutes past 7 in the Evening, the Time (very nearly) of High-water at *London Bridge*.

TYRO. I understand you well; but why is the Number 3 in particular to be added, will no other Number do?

PHILO. Not for the Port of *London*, but for other Ports or Places you must add different Numbers.

TYRO. I am now quite at a Loss, and should be very glad, that you would shew me the Reason, of High-water at a few noted Places, and how I may always find it.

PHILO. That I will very readily do.

6. *Shews the Reason of High water at London Bridge, and the Method of finding it in any other Port or Place.*

TYRO. You told me that if I add 3 to the Moon's South-  
ing, it tells me the Time of High-water at *London Bridge*; but  
for what Reason, pray?

PHILO. The full Tide in any Place depends upon the Point of  
the Compass the Moon happens to be upon; and the Distance in  
Degrees of such Point or Points, that are distant from the North  
or South Pole, converted into Time, gives the Hours and Mi-  
nutes to be added to her Southing.

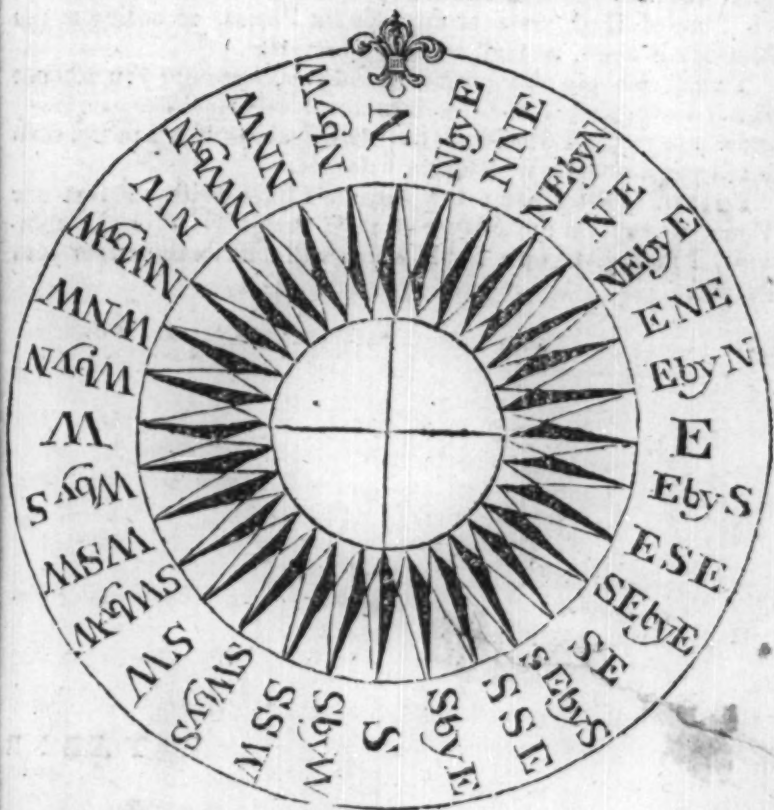
TYRO. But how am I to know the Method of reducing these  
Degrees into Time?

PHILO. Very easily; for I take it for granted, you know how  
many Points there are in the Compass, and also which are op-  
posite one to the other.

TYRO. Indeed I do not.

PHILO. Then it is high time you should, and you may soon  
do it by looking over the following Figure, called

7. *The Mariner's Compass.*



1. This



1. This Figure ought to be learnt by Heart, beginning at the North Point, and proceeding to the East, and so quite round.

2. You are also to learn what the Mariners call *boxing* the Compass, *viz.* to know immediately what Points are opposite; S. E. is opposite N. W. and N. W. by N is opposite S. E. by S. &c.

TYRO. I understand you well; but what is this to do with telling me High-water at different Places.

PHILO. Very much, it depends upon the Compass in a great Measure.

TYRO. Why so?

PHILO. You know every Circle contain 360 Degrees, and 15 Degrees contain 1 Hour in Time for  $15 \times 24 = 360$ .

TYRO. This I understand very well, but what is all this to our present Purpose?

PHILO. Very much; for as the Circle of Time is divided into 24 Parts of 15 Degrees each; so in this Figure, containing 32 Parts or Points of Wind, the Circle is divided by 32, each Point being  $\frac{1}{4}$  Part of the whole, or 11 Degrees, 15 Minutes, *viz.*  $11\frac{1}{4}$ , and therefore, whatever Part the Moon is upon from the North or South Point (converted into Time) shews the Time of High-water at the different Places, according to the Point she is upon, as shall be shewn hereafter.

TYRO. I begin now to understand you, but hope you will not take it amiss, that I enquire into the Reason of things: for I know you rather I should ask twenty Questions after a thing, than to tell you I understand it when I do not.

PHILO. That I had; but because I have neither Room nor Time, to explain the Nature of these things by proper Calculations, I shall give you a Table which will sufficiently answer your Purpose.

## TABLE I.

8. *An alphabetical List of several of the most noted Places, on or near the Coasts of Great Britain, France, Holland, &c. shewing what Point of the Compass the Moon is upon, to make High-water, as also the Time of High-water at such Places.*

Places.	Po.nts.	H   M
<b>A</b>		
Aldborough	SE by S & NW by N	9   45
Amsterdam	NE & SW	3
Antwerp	E & W	6
<b>B</b>		
Beachy and Blacktail	N & S	12
Berwick.	NE by N & SW by S	2   15
Brest	NE by E & SW by W	3   45
Bristol Key	E by S & W by N	6   45
Bridgewater	ESE & WNW	7   30
<b>C</b>		
Cork, Calais, C. Clear	ENE & WSW	4   30
Caskets	SE by S & NW by N	9   45
Cowes	SSE & NNW	10   30
<b>D</b>		
Dartmouth	E & W	6
Dover Pier and off Dunkirk	N & S	12
Dover, Diepe and Downs	SSE & NNW	
Dublin	SE by E & NW by W	8   15
Dunbar	SE & NW	9
<b>E</b>		
Embden	N & S	12
<b>F</b>		
Flanders Coast	N & S	12
Flushing	N by E & S by W	45
Flamborough	ENE & WSW	4   30
Foulness and near Falmouth	E by S & W by N	6   45
Foreland South	SSE & NNW	10   30
Foreland North	S by E & N by W	11   15
<b>G</b>		
Gibraltar Road	N & S	12
Gravesend	NNE & SSW	1   30
Groin	NE & SW	3
<b>H</b>		
Harwich within	S by E & N by W	11   15
St. Hellens	SSE & NNW	10   30
Hull and Hamborough	E & W	6
<b>I J</b>		
Irish Havens on the South	E by N & W by S	5   15
Jutland	N & S	12
<b>L</b>		
Leith	N & S	12

Places	Points	H	M
Leostaff	SW by S & NW by N	9	45
Lizard	ESE & WNW	7	30
London	NE & SW	3	
Lyn	E by S & W by N	6	45
M			
Maldon	N by E & S by W		45
Margate	S by E & N by W	11	15
Milford	E by N & W by S	5	15
N			
Nantz	NE & SW	3	
Naze	S by E & N by W	11	15
Needles and Wight Island	SE by E & NW by W	8	15
Newcastle	E by N & W by S	5	15
Newport	N & S	12	
Nore at the West End	N by E & S by W		45
P			
Plymouth	E by N & W by S	5	15
Portsmouth	N & S	12	
Portugal Coast	NE by E & SW by W	3	45
Portland Race	SE & N W	9	
Q			
Quin, or Queenborough	N & S	12	
R			
Rochester	N by E & S by W		45
Rotterdam	NE & SW	3	
Ramfey	E by N & W by S	5	15
S			
Scarborough	NE by E & SW by W	3	45
Severn at the Mouth			
Southampton at the Spits			
and along the Swin	N & S	12	
T			
Tinmouth and Tees	NE & SW	3	
Texel Cliffs	ENE & WSW	4	30
Torbay	E & W	6	
U			
Ushant Bay within	ENE & WSW	4	30
Ushant without	E & W	6	
W			
Winchelsea	N by E & S by W		45
Wells, Weymouth, and	E & W	6	
Waterford			
Y			
Yarmouth	SE by E & NW by W	8	15
Yarmouth Road	SSE & NNW	10	30
Z			
Zealand Coast	NNE & SSW	1	30
		6.	An

## 6. An Explanation of the foregoing Table.

TYRO. Be so kind, Sir, as to give me an Example or two of the proper Use of this Table.

PHILO. Suppose I wanted to know the Time of High-water at *London* at the Full and change of the Moon, and what Point the Moon is upon at the Time of High-water.

I look in the Table for *London*, and find against it NE and SW, which is 4 Points of the Compass from the North or South Points; that is 4 Times  $11\frac{1}{2}$ , which is 45 Degrees; now every 15 Degrees is 1 Hour, therefore, 45 must be 3 Hours from 12 o'Clock: But at *Torbay* I find the Hour to be 6; therefore the Moon at that Time is either on the East or West Point of the Compass.

TYRO. I understand this quite well; but how am I to find the Time of High Water at any Place.

PHILO. By either of the following Tables.

TABLE II.

Shews the Time of the Moon's Southing on every Day of her Age.			
Moon's Age.		Southing. Hours. Min.	
1	16	0	48
2	17	1	36
3	18	2	24
4	19	3	12
5	20	4	
6	21	4	48
7	22	5	36
8	23	6	24
9	24	7	12
10	25	8	
11	26	8	48
12	27	9	36
13	28	10	24
14	29	11	12
15	30	12	

TABLE III.

Time of Full Sea at Full and Change given (by Table I.) to tell it at any Time or Place.			
Moon's Age.		Time to be added.	
1	16	0	43
2	17	1	20
3	18	1	52
4	19	2	22
5	20	2	52
6	21	3	26
7	22	4	7
8	23	4	55
9	24	5	50
10	25	6	53
11	26	7	59
12	27	9	4
13	28	10	8
14	29	11	5
15	30	00	00

## The Use of Table II.

Example. Suppose the Moon to be 10 Days old; I demand the Time of her Southing?

I look into the Table for 10, her Age; and against it in the second Column I find 8, therefore I conclude that 8 Hours past Noon



Noon, *viz.* at 8 at Night, the Moon will be full South at 10 Days old.

N. B. You must note, that in the first Column you find 25 against 10; therefore as 8 in the second Column stands against 25, as well as 10, the Moon will be full South at 8 when she is 25 Days old, as well as when she is 10 Days old; but with this Difference, that at 25 Days old it will be 8 o'Clock in the Morning instead of the Evening.

9. *The Moon's Age being given, to tell the Time of High-Water on any Day at any Place.*

Example. Suppose the Moon 10 Days old (as in the last) I demand the Time of High-Water at *London Bridge, Yarmouth, and Torbay.*

1. I find by Table 2d, that the Moon is full South at 8 at Night, when she is 10 Days old (by the last Example) and turning to Table I. I find right against *London* 3 Hours; this being added to her Southing, (*viz.* 8.) makes 11; the Hour of the Night of High Water at *London Bridge.*

2. For *Yarmouth.* Look in Table I. as before, and right against it I find 8 Hours 15 Minutes, which I add to 8, the Moon's Southing (as before) and it gives 16 Hours 15 Minutes. This being above 12, I subtract 12 from it, and find 4 Hours 15 Minutes remain; therefore, it is 4 Hours 15 Minutes past Midnight, *viz.* 15 Minutes past 4 in the Morning.

For *Torbay.* I find 6 in the first Table, therefore I add 6 to the Moon's Southing, *viz.* 8, which gives 14, which being 2 above 12, shews it is High-Water at *Torbay* at 2 in the Morning, when the Moon is 10 Days old. And thus for any other Places.

TYRO. I understand you quite well; but what is the Use of Table III?

PHILO. Much the same in Effect as Table II. for having found the Time of Full Sea, or High-Water, upon the full and change Days by Table I. then seek the Age of the Moon, that Time in this Table, and the Hours and Minutes that stand against her Age in the second Column hereof, which are to be added to what you found in the first Table, and will give the Time of High-Water nearly at that Place and Time.

TYRO. Pray give me an Example.

PHILO. I will.

Suppose the Moon 9 Days old. I demand the Time of High-Water in the *Downs.*

By Table I. The Moon being S S E, or N N W, makes a Full Sea upon full and change Days; look in Table I. and against the Word *Downs* you will find 10 Hours 3 Minutes. Also against 9 her Age in Table III. stands 5 Hours 50 Minutes,

nutes, which added to 10 Hours 3 Minutes, gives 16 Hours 20 Minutes; from which take 12 (when it is above 12) there remains 4 Hours 20 Minutes, which is 20 Minutes past 4 in the Morning. Do you understand it?

TYRO. Quite well. — And now I should be glad if you would shew me a few Questions in *Navigation*.

## SECT. VII.

### Of NAVIGATION.

TYRO. What do you mean by Navigation?

PHILO. Navigation is that Branch of the Mathematics, or that Art which teaches to guide or conduct a Ship safely from one Port to another, or to any known Place in the World, and is built upon the Knowledge and Practice of *Geometry* and *Trigonometry*, &c.

TYRO. What are the different Methods of practical Navigation?

PHILO. It is divided into three principal Parts, viz. *Plain-Sailing*, *Mercator-Sailing*, and *Circular-Sailing*.

#### I. Of PLAIN-SAILING.

TYRO. What do you mean by Plain-Sailing?

PHILO. Plain-Sailing is the Foundation of the others, being the most simple and easy of all, and will do very well at or near the Equinoxial, but is more or less erroneous the further we are from that Line or Part of the World.

TYRO. What is the Reason of this?

PHILO. Because at or near the Equinoxial, the Degrees of Longitude as well as Latitude, are nearly equal, but in advancing towards the Poles are not so.

TYRO. Please to give me an Example or two.

PHILO. I will.

#### PROBLEM I.

*Suppose a Ship to sail S E by S, (called the Rumb or Point of the Compass) 124 Leagues; I demand her Difference of Latitude and Departure from the Meridian, viz. the Longitude she is then in.*

N. B. Always remember to bring the Leagues into Miles or Minutes before you work the Question.

DEFI-

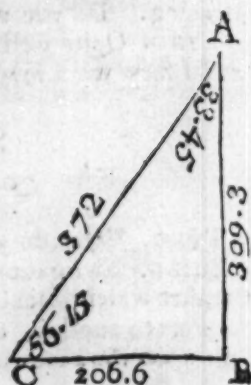
# THE YOUNG MAN'S DEFINITION.

Fig. 1.

In the Triangle A B C the Hypothenufe A C is the Distance sailed or Rhumb-Line, B C the Departure or Longitude, and A B the Difference of Latitude. Then,

## 1. To find the Difference of Latitude,

As Radius or S of 90 - - 10.00000  
To the Log. of the Distance sailed 372'  
So is the Sc of  $\angle A$   $56^{\circ} 15'$  the Course  
To Log. of the Side A B 309' 3  
This divided by 60 gives  $5^{\circ} 9' 18''$  the  
Difference of Latitude.



## 2. To find the Departure B C from the Meridian.

As Radius 90  
To the Logarithm of the Rhumb-Line A C 372'  
So is the S of  $\angle A$  of the Course of A  $33^{\circ} 45'$   
To the Logarithm of the Side B C  $206' \frac{6}{10}$  her Departure, which  
divided by 60 gives  $3^{\circ} 26' 36''$  the Difference of Longitude.

## OBSERVATION.

By the first Operation, you may tell how far you have sailed North or South, called Northing or Southing; by the second, how far you have sailed East or West, called Easting or Westing.

### By Gunter's Scale.

Set one Foot of the Compass in Radius (*viz.* at 8 Points, because 8 Times  $11 \frac{1}{4}$ , which is one Point, is = 90), then extending the other to 372; the same Extent will reach from the S. of Course A, *viz.*  $33^{\circ} 45'$  (which is 3 Points) to  $206 \frac{6}{10}$  the Departure; and the Compasses still remaining at the same Distance will reach from the Sc of the Course C  $56^{\circ} 15'$  (*viz.* from 5 Points or 5 Times  $11 \frac{1}{4}$ ) to  $309 \frac{3}{10}$  the Difference of Latitude =  $5^{\circ} 9' 18''$  as before.

N. B. This Example by Gunter well understood will be sufficient for all.

## PROBLEM II.

The Rhumb (or Point of the Compass the Ship Sails upon) and Difference of Latitude being given to find the Distance and Departure.

DEFI.

## DEFINITION.

In the foregoing Figure A B C, suppose a Ship to sail SE by S till the Difference of her Latitude be  $AB = 309' \frac{3}{10}$  Minutes; I demand her distance sailed, *viz.* A C, and her Departure from the Meridian, *viz.* C B.

## 1. To find the Distance.

As Sc of  $\Delta$  of the Course A  $56^\circ 15'$   
 To the Log. of the Side A B, the Diff. of Lat.  $309' \frac{3}{10}$   
 So is Radius or 90  
 To the Log. of the Side A C  $372'$ ,  
 Which is the Distance sailed.

## 2. For the Departure.

As the Sc of  $\Delta$  of the Course A  $56^\circ 15'$   
 To the Log. of the Side A B the Diff. of Lat.  $309' \frac{3}{10}$   
 So is the S of the  $\Delta$  of the Course A  $33^\circ 45'$   
 To the Log. of the Side B C the Departure  $206' \frac{6}{10}$ . Or,  
 As Radius to the Distance  $372$ ; so is the Sine of the  
 Course  $56^\circ 15'$  to the Departure  $206' \frac{6}{10}$

N. B. This is only the Reverse of Problem the first, and; therefore, easily performed by Gunter's Scale.

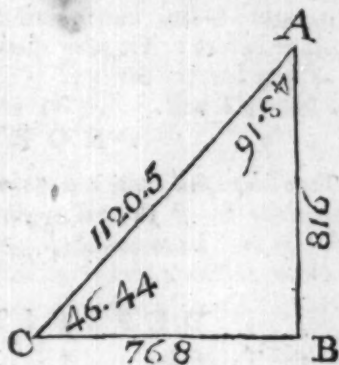
## PROBLEM III.

The Difference of Latitude and Longitude given to find Rhumb and Distance.

## DEFINITION.

Fig. 2.

In the Triangle A B C, let A represent any Place (suppose the Lizard) that the Ship is in, A B the direct Line or Parallel thereof; let the Point C be called the Isle of St. Mary in the Azores, and C B its Meridian. Then, there is given the Side A B  $= 816'$  the Distance of the Lizard from the Meridian of St. Mary, or the Distance of Longitude; C B the Difference of Latitude  $768'$ . Then,



## 1. To find the Rhumb or Angle at C.

As the Logarithm of the Side B C  $768'$   
 To Radius ————— 10.0000  
 So is the Logarithm of the Side A B  $816$   
 To the Tangent of the Rhumb or Angle at C  $46^\circ 44'$ ; this divide



vide by  $11 \frac{1}{2}$  (the Degrees in one Point or Rhumb) gives 4 Rhumb Points and  $1^{\circ} 44'$  more, which shews that the Rhumb or Point of the Compass is, from the *Lizard* to *St. Mary's* the 4th Rhumb from that Meridian, and  $1^{\circ} 44'$  or nearly  $1 \frac{1}{2}$  Degrees more, viz. S W and  $1 \frac{1}{2}$  Degrees nearly still more westerly: But if you take it from *St. Mary's* to the *Lizard*, then it will be the opposite Rhumb, or Point of the Compass, viz. N E and  $1^{\circ} 44'$  more easterly, the Reverse of the former.

### 2. For the Distance AC

As the S of Rhumb or  $\nearrow$  at C  $46^{\circ} 44'$ ,

To the Log. of the Side AB  $816'$ ,

So is the Radius,

To the Log. of the Hypoth. AC  $1120 \frac{5}{6}$ , which is the Distance from the *Lizard* to *St. Mary's*, the Distance by the plain Chart or sailing. Do you understand it, *Tyro*.

TYRO. I understand it very well, Sir, but should have been better pleased if you had wrought the Questions out at length.

PHILO. I thought so with myself; but I assure you it is of more Advantage to you upon the whole; for consider, *Tyro*, I have not left you without the Manner of working every Question, and certainly you cannot be so idle as not to put these Rules in Practice; and though I grant it is a little more Trouble, yet I am sensible, if you work them yourself and find them agreeable to the Answers here laid down; it will increase your Knowledge more, and give you ten Times the Satisfaction than if they were fully answered to your Hand.

TYRO. I believe what you say to be true, Sir, for indeed I own, as you have given all the Sides, Angles, &c. I have nothing more to do, but to find their Logarithms accordingly, and work as before: But pray then give me another Example, if it be of any further Service.

PHILO. I will.

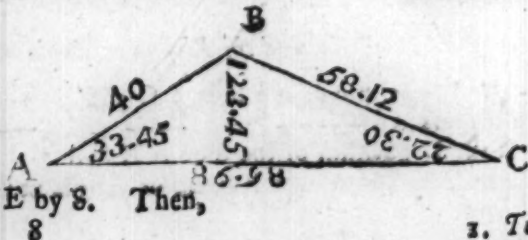
### PROBLEM IV.

Two Ships sail from a certain Port A; one sails ENE  $40'$ , the other E by S, so far till she finds the first Ship to bear from her N W by N; I demand the second Ship's Distance from the Port A; and their Distance then from each other.

#### DEFINITION.

Fig. 3.

In the Triangle ABC, let A be the Port from which both the Ships sail; AB the ENE Course, and AC the Course E by S. Then,



## 1. To find the Distance of the second Ship.

As the S of the  $\nabla$  C,  $22^{\circ} 30'$   
 To the Log. of the Side AB  $40'$   
 So is the S of the  $\nabla$  at B  $123^{\circ} 45'$   
 To the Log. of the Side AC  $86.98$ , the Distance of the second Ship from the Port.

## 2. To find the Distance of the two Ships, viz. the Side BC.

As the S of the  $\nabla$  at C  $22^{\circ} 30'$   
 To the Log. of the Side AB  $40'$   
 So is the S of the  $\nabla$  A  $33^{\circ} 45'$   
 To the Log. of the Side BC  $58.12$ , the Distance of the two Ships, viz. B and C.

Do you understand it, Tyro?

TYRO. Sir, I acknowledge I am not quite perfect, but I see the Nature and Manner of working of the Problems very plainly.

PHILO. That's sufficient; then I will set you a few Questions or Problems, by Way of Exercise, to which you may prefix any Angles or Numbers.

## PROBLEM V.

*A Ship sails SW by W, till her difference of Longitude (viz. her Departure from the Meridian) is 220 Minutes; I demand the Distance sailed, and Difference of Latitude.*

## 1. For the Distance.

As S of the Course SW by W, (viz.  $56^{\circ} 15'$ ) to the Departure  $220'$ : So is Radius, to the Distance  $265$  Minutes =  $88$  Leagues one Mile.

## 2. For the Difference of Latitude.

As Radius : Distance  $265' ::$  Sc of  $56.15$ , the Course, viz.  $33^{\circ} 45'$  : Difference of Latitude  $147.2$  Minutes, viz.  $2^{\circ} 27' 12''$

By Gunter.

Extend the Compasses from 5 Points, viz.  $5 \times 11 \frac{1}{4} = 56^{\circ} 15'$ , to the Departure  $220'$ , this will reach to Radius, viz. 8 Points to 265 Minutes, the Distance. Again, the same Extent of the Compasses will reach from the Sc (3 Points) to the Difference of Latitude  $147.2$  Minutes, as above.

## PROBLEM V.

*The Distance 247, and Departure 197 given, to find the Course and Difference of Latitude.*

Y

1. For

1. *For the Course.*

As the Log. of the Distance : Radius :: the Departure 197 : S of the Course  $52^{\circ} 54'$ .

2. *For the Difference of Latitude.*

As Radius : Distance 247 :: Sc of Course  $37^{\circ} 6'$  : Difference of the Latitude 149.

By Gunter.

Extend the Compasses from 247 to 197, and the same Distance will reach from Radius to the Sine of the Course  $52^{\circ} 54'$ . Also the Extent from Radius to the Sc of the Course  $37^{\circ} 6'$  will reach the same Way from the Distance 247 Minutes, to the Difference of Latitude 149 Minutes.

TYRO. I am obliged to you, Sir ; and now please to tell me something concerning what is commonly called *Mercator's Sailing*.

PHILO. It must be very little then, because if Opportunity would allow of it, Room will not ; but however I will grant your Request.

2. *Of sailing by the true Chart, called Mercator's\*.*

TYRO. What do you mean by *Mercator's Sailing* ; and what is the Difference between this and Plain Sailing ?

PHILO. By *Mercator's Chart* all Places are laid down, with great Truth on the Globe, respecting both their *Latitudes*, *Longitudes*, *Bearings* and *Distance* ; but this is better understood by the following Table of Meridional Parts or Difference of Latitudes, and its Use applied to Practice.

\* Though this is called *Mercator's Sailing*, yet it appears by the best of Authors that I could ever yet see, that the Invention belongs to our own Countryman Mr. *Wright*.

## A TABLE of Meridional MILES.

Degrees of Latitude.	Minutes in each Degree.						The Difference.
	0	10	20	30	40	50	
	Meridional Miles.						
0	0	10	20	30	40	50	10
1	60	70	80	90	100	110	10
2	120	130	140	150	160	170	10
3	180	190	200	210	220	230	10
4	240	250	260	270	280	290	10
5	300	310	320	330	340	350	10
6	360	370	380	390	400	410	10
7	421	431	441	451	461	471	10
8	481	491	501	511	521	532	10
9	542	552	562	572	582	592	10
10	603	613	623	633	643	653	10
11	664	674	684	694	704	715	10
12	725	735	745	755	766	776	10
13	786	797	807	817	827	838	10
14	848	858	869	879	889	900	10
15	910	920	931	941	951	962	10
16	972	983	993	1004	1014	1024	10
17	1035	1045	1056	1066	1077	1087	10
18	1098	1108	1119	1129	1140	1150	10
19	1161	1172	1182	1193	1203	1214	10
20	1225	1235	1246	1257	1267	1278	11
21	1289	1299	1310	1321	1332	1342	11
22	1353	1364	1375	1386	1396	1407	11
23	1418	1429	1440	1451	1462	1473	11
24	1484	1499	1505	1516	1527	1538	11
25	1549	1561	1572	1583	1594	1605	11
26	1616	1627	1638	1649	1661	1672	11
27	1683	1694	1705	1717	1728	1738	11
28	1751	1761	1773	1785	1796	1808	11
29	1819	1830	1842	1853	1865	1877	11



## A TABLE of Meridional MILES.

Degrees of Latitude.	Minutes in each Degree.						The Difference.
	0	10	20	30	40	50	
	Meridional Miles.						
30	1888	1899	1911	1923	1934	1946	12
31	1958	1969	1981	1993	2004	2016	12
32	2028	2040	2052	2063	2075	2087	12
33	2099	2111	2123	2135	2147	2159	12
34	2171	2183	2195	2207	2219	2231	12
35	2244	2256	2268	2281	2293	2305	12
36	2318	2330	2342	2355	2367	2380	12
37	2392	2405	2417	2430	2442	2455	12
38	2468	2481	2493	2506	2519	2532	13
39	2544	2557	2570	2583	2596	2609	13
40	2622	2635	2648	2662	2675	2688	13
41	2701	2714	2728	2741	2754	2767	13
42	2781	2795	2808	2822	2835	2849	13
43	2863	2876	2890	2904	2918	2931	14
44	2945	2959	2973	2987	3001	3015	14
45	3030	3044	3058	3072	3086	3101	14
46	3115	3130	3144	3159	3173	3188	14
47	3202	3217	3232	3247	3261	3276	15
48	3291	3306	3321	3336	3351	3366	15
49	3382	3397	3412	3428	3443	3459	15
50	3474	3490	3505	3521	3537	3553	16
51	3568	3584	3600	3616	3632	3649	16
52	3665	3681	3697	3714	3730	3747	16
53	3763	3780	3797	3814	3830	3847	17
54	3864	3881	3899	3916	3933	3950	17
55	3968	3985	4003	4020	4038	4056	18
56	4074	4092	4110	4128	4146	4164	18
57	4182	4201	4219	4238	4257	4275	18
58	4294	4312	4331	4351	4370	4390	20
59	4409	4428	4448	4468	4487	4507	20

## A TABLE of Meridional MILES.

Degrees of Latitude.	Minutes in each Degree.						The Difference.
	0	10	20	30	40	50	
	Meridional Miles.						
60	4527	4547	4567	4588	4608	4629	20
61	4649	4670	4691	4711	4733	4754	21
62	4775	4796	4818	4839	4861	4883	22
63	4905	4927	4949	4972	4994	5017	23
64	5039	5062	5085	5108	5132	5155	23
65	5179	5203	5226	5250	5275	5299	24
66	5324	5348	5373	5399	5423	5449	25
67	5474	5500	5526	5552	5578	5604	26
68	5631	5658	5685	5712	5739	5767	27
69	5795	5823	5851	5879	5908	5937	28
70	5966	5996	6025	6055	6085	6115	30
71	6146	6177	6208	6239	6271	6303	31
72	6335	6368	6401	6434	6468	6501	33
73	6535	6570	6605	6640	6675	6710	35
74	6747	6783	6820	6857	6895	6933	37
75	6972	7010	7050	7089	7130	7170	40
76	7211	7253	7295	7338	7381	7424	43
77	7469	7514	7559	7605	7651	7698	46
78	7746	7795	7844	7894	7944	7996	50
79	8048	8100	8154	8209	8264	8320	55
80	8377	8435	8495	8555	8616	8678	60
81	8742	8806	8872	8939	9007	9077	68
82	9148	9221	9295	9371	9449	9528	77
83	9609	9692	9778	9865	9954	10046	88
84	10141	10238	10338	10441	10546	10656	105
85	10770	10887	11007	11133	11263	11398	128
86	11539	11686	11839	11999	12168	12344	165
87	12521	12718	12927	13150	13388	13644	230
88	13920	14221	14550	14914	15324	15783	
89	16318	16950	17726	18729	20152	22623	

TYRO. What is the Use of this Table ?

PHILO. The Use is to find the Meridional Miles and Parts in any Latitude, or between two given Places differing in Latitude, as follows.

1.

If one Place is under the Equator, and another North or South Latitude, then the Number answering to the last is the Meridional; thus the Difference between the Meridional Miles under the Equator, which observe is (0) and in N Latitude  $52^{\circ}$  is 3665 Miles; and in  $25^{\circ}$  S Latitude it is 1549 Miles; as you will find to stand right against these Numbers 25 and 52.

2.

If two Places have both North or both South Latitude, then the Meridional Parts or Miles belonging to each subtracted, will give the Meridional Difference of Latitude in Miles. Thus, suppose one Place  $52^{\circ}$  North (which is 3665') the other  $40^{\circ}$  N (which is 2622') their Difference is 1043' the Meridional Difference, &c.

3.

If one Place be North, and the other South Latitude, then add their Meridional Parts together gives the Meridional Difference. Thus, in  $52^{\circ}$  North the Miles answering in the Table are 3665; and against any other Number at Pleasure (supposing  $40^{\circ}$  South) stands 2622; this added to 3665 North, gives 6287; the Meridional Difference of Latitude. And thus for any Places.

TYRO. This is easy enough; but pray can't you give me an Example or two at large ?

PHILO. I will do any thing to serve you, but it will be proper first of all to give you an Example of the Use of the Table.

*The Use of the Table.*

Suppose one Place in  $21^{\circ}$  North Latitude, the other in  $52^{\circ}$  N. What is the Meridional Difference of Latitude in Miles ?

The Meridional Parts of $52^{\circ}$ are	—	3665
The Meridional Parts answering to $21^{\circ}$ are		1289

Difference 2376

N. B. If one had been North and the other South, then add them. Thus  $52^{\circ}$  N, and  $21^{\circ}$  S, is only adding the above numbers together answering thereto, which is 4954.

PROBLEM I.

*Having the Latitude, and Distance of two Places, to find the Rhumb and Difference of Longitude.*

1. To find the Rhumb or Course.

As the Distance to Radius, so is the Difference of Latitude to the Sine Complement of the Rhumb required; Then,

2. To

2. *To find the Difference of Longitude.*

As Radius to the Difference of Latitude in Meridional Parts, so is the Tangent of the Rhumb, to the Difference of Longitude required.

## P R O B L E M II.

*The Latitudes and Difference of Longitude of any two Places, to find the Rhumb and Distance.*

1. *To find the Rhumb.*

As the Meridional Difference of Latitude in Miles to Radius, so is the Difference of Longitude in Miles, to the Tangent of the Rhumb required.

2. *To find the Distance.*

First find the Difference of Latitude in the common Way, and bring it into Miles, by multiplying by 60; then say,

As the Sine Complement of the Course, to the proper Difference of Latitude in Miles; so is Radius to the Distance in Miles.

## P R O B L E M III.

*Having the Latitude and Rhumb of two Places given; to find their Distance, and Difference of Longitude.*

1. *To find the Distance.*

As the Sine Complement to the Difference of Latitude, so is the Radius to the Distance.

2. *To find the Difference of Longitude.*

As Radius to the Difference of Latitude in Meridional Parts, so is the Tangent of the Rhumb to the Difference of Longitude required.

## P R O B L E M IV.

*Having the Rhumb, Distance, and one Latitude given; to find the other Latitude with the Difference of Longitude.*

1. *To find the other Latitude.*

As Radius to the given Distance, so is the Sine Complement of the Rhumb; to the other Latitude required.

2. *To find the Difference of Longitude.*

As Radius to the Difference of Latitude in Meridional Parts, so is the Tangent of the Rhumb, to the Difference of Longitude required.

## P R O B L E M V.

*Having the Difference of Longitude, the Rhumb, and one Latitude given, to find the Distance and other Latitude.*



1. *To find the other Latitude.*

As the Tangent of the Rhumb to the Difference of Longitude in Parts, so is the Radius to the Meridional Difference of Latitude in Parts required.

2. *For the Distance.*

As the Sine Complement of the Difference of Latitude, so is the Radius or Sine of 90, to the Distance required.

These Problems, *Tyro*, you may easily try by any Numbers you please; and therefore, I shall now give you an Example or two in Circular-Sailing.

3. *Of CIRCULAR-SAILING.*

TYRO. What do you mean by Circular-Sailing?

PHILO. Circular-Sailing is sailing by the Rules of *Spherical Trigonometry*, or by the Knowledge of Spherical Circles, and therefore must be the most exact Way, and best Method of all others.

TYRO. Then I perceive that Plain Sailing only supposes the Earth to be like a Circle or plain Superficies.

PHILO. You say right, and therefore plain *Trigonometry* will answer all such Questions; and from hence it may very properly be said to sail, or to suppose to sail in *Plano*, or otherwise Plain-Sailing.

TYRO. But pray how is it possible to keep sailing for any considerable Distance, exact in the Arch of a great Circle?

PHILO. 'Tis impossible to keep quite close to this Method, because of the Roughness of the Sea at Different Times and Places, and the Uncertainty of the Wind, &c. but yet, Circular-Sailing is of great Advantage, particularly in long Voyages, that have direct *East* and *West* Courses.

TYRO. Pray tell me, in short, what the Difference is then between Circular-Sailing and the two former?

PHILO. In *Plain*, and *Mercator's* Sailing, *Meridians*, Rhumbs, and Parallels are used as the Sides of Triangles; but in *Circular Sailing* the Rhumbs are used as Heli-Spherical Lines, but the Parallels are not used as the Sides, because they are not the Archs of great Circles. In short, in Circular Sailing, the *Meridian*, or Archs of *Meridians* and Equinoxial, are used to form, or make a Triangle agreeable to, and answer every Course and Distance.

TYRO. I understand your Meaning very well; but are there no Rules first to be known before we begin to work any Problems?

PHILO. I see no Occasion for any, as you have before been taught *Geography*; however, observe,

1. Should two or more given Places lie under the Equinoxial, or in equal Parallels thereto, then is their Position East and West; there-

therefore the Difference of their Longitudes converted into Miles gives their proper Distance. And,

2. Should they lie under the same Meridian, (*viz.* North and South of each other) then their Difference in Degrees converted into Miles tells the Difference of their Latitude.

PROBLEM I.

*Let there be two Places (or two Ships at Sea) lying in the same Latitude, and let the Difference of their Longitude be given; it is required to find the nearest Distance from each other in the Arch of a great Circle, and the true or direct Position or Situation from each other.*

1. *For their nearest Distance.*

As Radius, to the Sc of the given Latitude; so is the S of  $\frac{1}{2}$  the Difference of Longitude, to the S of  $\frac{1}{2}$  the Distance required, the Double of which gives the Distance required.

2. *For the direct Position or Situation.*

As Radius, to the S of Latitude; so is the Tangent of  $\frac{1}{2}$  the Difference of Longitude to the Tc of the  $\sphericalangle$  Position required.

PROBLEM II.

*Suppose two Ships (or two Places) are under the Equinoxial, the other in any given Latitude, with the Difference of Longitude being given; it is required to find, first, the Distance from each other; 1. the direct Position or Situation from the first to the second, and also the direct Position or Situation in respect of each other.*

1. *To find the nearest Distance.*

As Radius to the Sc of the Difference of Longitude, so is the Sc of the Difference of Latitude, to the Sc of the Arch of the Distance required.

2. *To find the Position from the first to the second Place.*

As Radius to the S of the Difference of Latitude, so is the Tc of the Difference of Longitude, to the Tc of the Angle of Position.

3. *For the Position from the second to the first Place.*

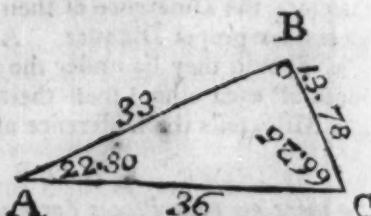
As Radius to the S of the Difference of Longitude, so is the Tc of the Difference of Latitude, to the Tc of the Angle of Position.

PROBLEM.

*Coming off the main Ocean, I had the Sight of a Cape, and intended to sail to it; I find it to bear from me NNW, and by Computation 33 Miles Distance. But having continued my Course N for 36 Miles from this Observation; I there anchored: Now I desire to know how the said Cape now bears, and its Distance from me?*

In

In the annexed Figure or Triangle A B C, I suppose the ship to be at A, and the Cape B, to bear from me N N W  $33'$ ; then sailing from my first Station A, to the second Station at C,  $36'$  North, I would then know Distance and Bearing of the Cape B from the Point C.



1. In this Triangle are given  $AB=33$ ,  $AC=36$ , and the Angle  $A=22^\circ 30'$ .

*To find the Angle at C.*

As the Sum of the Sides A C and A B, to the Difference of the same Sides, so is the T of  $\frac{1}{2}$  the unknown  $\angle$ 's, B and C, viz.  $78^\circ 45'$ , to the T of  $12^\circ 20'$ , which taken from  $78^\circ 45'$ , leaves  $66^\circ 25'$  for the  $\angle$  at C; so that the Bearing of the Cape B, from C, is  $1^\circ 5'$ , W S W. Do you understand me?

TYRO. Very well, except it be, I don't know from whence the above  $78^\circ 45'$  comes from, nor the last  $1^\circ 5'$ , the bearing.

PHILO. I'm surprized to see you at a Loss in things so plain. Observe then the Angle  $A=22^\circ 30'$ , then must the other  $2 \angle$ 's B and C be  $=157^\circ 30'$ , because  $157^\circ 30' + 22^\circ 30' = 180^\circ =$  to all the  $\angle$ 's of any Triangle; now the  $\frac{1}{2}$  of  $157.30 = 78^\circ 45'$ , and the Tangent found is  $12^\circ 20'$ . But every Point or Rhumb of the Compass, if you remember, is  $11^\circ 15'$ , therefore  $12^\circ 20' - 11^\circ 15' = 1^\circ 5'$ , the Bearing of the Cape B from C from the W to the S, viz. W S W.

TYRO. I thank you, Sir, and am now quite satisfied with the whole Operation.

PHILO. Then I'll proceed,

2. *To find the Distance B from the Ship at C.*

As the S of the  $\angle 66^\circ 25'$ , to the Log. of the Side A B  $33'$ , so is the S of the  $\angle$  at A  $22^\circ 30'$ , to the Log. of the Side B C  $13' 78''$ ; so that the Cape is distant rather more than  $13\frac{1}{2}$  Miles.

## S E C T. VIII.

*Here follows a Collection of Problems proper for the young Practitioner in the further Knowledge of Astronomy, Navigation, &c.*

### P R O B L E M I.

*The Sun's Place given, to find his Right-Ascension.*

As Radius to the T of the Sun's Longitude from the next Equinoxial Point, so is the Sc of his greatest Declination, to the T of his Right-Ascension from the next Equinoxial Point.

P R O B.

PROBLEM II.

*The Declination of the Sun being given, to find the Sun's Place or Longitude from Aries.*

As the S of the ☉ greatest Declination, to Radius; so is the S of his present Declination to the S of the Sun's Place.

PROBLEM III.

*The ☉'s Declination given, to find his Right-Ascension.*

As Radius to the Tc of the Sun's greatest Declination; so is the T of the given Declination, to the Right-Ascension, from ♀ or ♂ as required.

PROBLEM IV.

*The Latitude and Sun's Declination given, to find the Ascensional Difference.*

As Radius to the Tc of the given Latitude, so is the T of the Sun's Declination given to the S of the Ascensional Difference required in Degrees and Minutes, which converted into Time (as in Prob. 16. p. 137.) gives the Time the Sun rises or sets after six o'Clock.

PROBLEM V.

*To find the Sun's oblique Ascension and Descension.*

1. Find his Right-Ascension by Prob. 1. and his Ascensional Difference as in the last; then observe, if his Declination be North, to subtract the Ascensional Difference, out of his Right-Ascension in the 6 northern Signs, and it gives the oblique Ascension; but added to the Right-Ascension, gives the oblique Descension.

2. But should the Sun have a South Declination, then add the Ascensional Difference to the Point given in the 6 southern Signs to the Right-Ascension, gives the oblique Ascension, but subtracted from the same gives the oblique Descension.

PROBLEM VI.

*The Latitude and Sun's Declination given, to find his Amplitude.*

As the Sc of the Latitude, to Radius; so is the S of the Sun's Declination, to the S of the Amplitude from the East and West Point of the Horizon.

N. B. This Problem is of great Use for finding the Variation of the Needle; for the Sum, or Difference of the Sun's Amplitude, and Magnetic Amplitude (according as it may happen) gives the Variation required.

PROBLEM VII.

*Having the Sun's Amplitude from the North Point, and his Declination given, to find the Latitude.*

As



As the Sc of the Amplitude from the North Point to Radius, so is the S of the given Declination, to the Sc of the Latitude required.

## PROBLEM VIII.

*The Latitude and Sun's Declination given, to tell on any Day what Time the Sun will be upon the true East and West Points.*

As the T of the Latitude, to the T of the Sun's Declination; So is Radius, to the Sc of the Hour from Noon.

## PROBLEM IX.

*The Latitude and Sun's Declination given, to find his Altitude at six o'Clock.*

As Radius to the Sun's Declination, so is the S of the given Latitude to the Sun's Altitude at six.

## PROBLEM X.

*The Latitude and Sun's Declination given, to find the Azimuth at six o'Clock.*

As Radius to the T of the Sun's Declination, so is the Sc of the Latitude of the Place, to the T of the Azimuth sought.

N. B. This Problem is of great Use to find the Position or Declination of any Place from the North and South in order to fix a Sun Dial.

## PROBLEM XI.

*Having the Latitude and Sun's Declination, to find his Altitude on the East and West Points.*

As the S of the Latitude to Radius, so is the S of the Declination to the S of the Sun's Altitude at due East and West.

## PROBLEM XII.

*The Latitude given, to find the Sun's Altitude at any Time.*

As Radius : Tc of the Latitude :: the S of the Sun's Distance from six o'Clock : T of a 4th Arch, which being taken out of the Sun's Distance from the Pole, gives a 5th Arch : Then say,

As the Sc of the 4th Arch thus found : Sc of the remaining or 5th Arch :: the S of the Pole's Height or Latitude : S of the Sun's Altitude all the Time required.

## PROBLEM XIII.

*The Sun's Declination, Altitude, and Hour from Noon given, to find the Azimuth.*

As the Sc of the Sun's Altitude : S of the Hour from Noon :: the Sc of the Sun's Declination : S of the Azimuth required.

## PROBLEM XIV.

*The Sun's Altitude, Declination and Azimuth given, to find the Latitude.*

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As the S of the Sun's Azimuth : S of his Distance from the North Pole :: the  $\sphericalangle$  of the Sun's Position : Sc of the Latitude required.

## PROBLEM XV.

*Having the Latitude given, as also the Sun's Altitude and Hour from Noon, to find the Angle of the Sun's Position.*

As the Sc of the Sun's Altitude : S of the Hour from Noon, :: the Sc of the Latitude to the S of the  $\sphericalangle$  of the Sun's Position.

## PROBLEM XVI.

*To find what Angle the Ecliptic makes with the Meridian.*

As Radius : S of the Sun's greatest Declination :: Sc of the Sun's Right-Ascension from the next Equinoxial Point : Sc of the  $\sphericalangle$  of the Ecliptic with the Meridian.

## PROBLEM XVII.

*Having the Sun's Altitude, Declination and Azimuth, to find the Latitude.*

As the S of the Sun's Azimuth : S of his Distance from the N. Pole :: the S of the Angle of the Sun's Position : Sc of the Latitude required.

*N. B.* Here follows a Collection of Problems relating to Astrology, rather for Curiosity than any immediate Dependence upon future Events; though many of them are not without their Advantages, nor altogether without some Certainty, if what the Problem is built upon is true, both as to Circumstance and Time, in which Cases many natural Presages and Predictions have happened according to such and such Calculations.

## PROBLEM XVIII.

*The Distance of the Sun, from either of the Equinoxial Points  $\gamma$ , or  $\omega$  being given, to find his Declination.*

As Radius or S of 90 : S of the Sun's Distance from the next equinoxial Point :: the S of the Sun's greatest Declination : S of his present Declination.

## PROBLEM XIX.

*To find the Quantity of any Angle of the 12 Houses, or the Quantity of the Angles which the Circles of the 12 Houses make with the Meridian.*

As Radius : Tang. of 30 for the 2, 6, 8, and 12th House (or the Tang. of 60 for the 3d, 5, 9, and 11th House) :: the Sc of the Pole : Tc of any House with the Meridian.

*N. B.* The 1st House is called the Horoscope or Angle of the East; the 7th House the  $\sphericalangle$  of the West; the 4th the  $\sphericalangle$  of the North; and the 10th the  $\sphericalangle$  of the South.

## PROBLEM XX.

*To find the Right Ascension of the Point of the Equinoctial called Medium Cœli.*

Find the Sun's Right Ascension, then reduce the Time from Noon last past into Degrees, and add this to the Sun's Right-Ascension; and the Sum shall be the Right-Ascension of the Point then in the Equinoctial, which is called *Medium*, or *Cor Cœli*.

## PROBLEM XXI.

*To find the Angle of the Ecliptic with the Horizon.*

As Radius : Sc of the Altitude of *Cor Cœli* :: the S of the  $\angle$  of the Ecliptic with the Meridian : Sc of the  $\angle$  of the Ecliptic required.

## PROBLEM XXII.

*Having the Altitude of Medium Cœli, and the Angle of the Ecliptic with the Meridian given, to find the Distance of the Azimuth from the Meridian, otherwise the Amplitude Ortive of the Ascendant, \* or Horoscope.*

As Radius or S of  $90^\circ$  : S of Medium Cœli :: the T of the  $\angle$  of the Ecliptic with the Meridian : Tc of the Amplitude Ortive of the Ascendant.

## PROBLEM XXIII.

*Having the Angle of the Ecliptic and the Altitude of Medium Cœli given, to find the Cusp of the first Point of any of the 12 Houses.*

N. B. The Amplitude Ortive of the Ascendant is equal to the Distance of the Azimuth of  $90$  from the Meridian, therefore the Cusp or Ascendant Degree of the first House is thus found.

As Radius or S of  $90$  : Sc of the  $\angle$  of the Ecliptic with the Meridian :: the Tc of the Altitude of *Cor. or Med. Cœli* to the T of the Distance of *Med. Cœli* from the Ascendant Degrees.

## PROBLEM XXIV.

*To find the Altitude of the Pole above any of the Circles of the 12 Houses.*

N. B. If the Angle of the Circle of the House be not given, find it by Problem 19th. Then,

As Radius : Sc of  $\angle$  of the Circle of the given House :: S of the Pole's Elevation or Latitude : S of the Altitude of the Pole above the Circle of Position of any given House.

\* N. B. The Ascendant is that Degree of the Equator, which rises the Time any Person is born, &c. and Horoscope is that Degree of the Ascendant, or that Star or Planet which rises, and which is then taken notice of in order to predict any Event, or calculate the Time and Circumstance of future Events.

PROB.

PROBLEM XXV.

*Having the Latitude and Declination of any fixed Star given, to tell when it will be due East and due West.*

As the S of the Pole's Altitude : Radius :: the S of the Star's Declination : S of the Star's Elevation above the Horizon, upon the true East and West Points.

PROBLEM XXVI.

*To find the Moon's Horizontal Parallax.*

As the Distance of the Moon from the Center of the Earth : Earth's Semi-Diameter :: Radius or S of 90 : S of the Moon's Horizontal Parallax in that Distance.

PROBLEM XXVII.

*Having the Moon's Altitude and Horizontal Parallax given, to find her Parallax in any apparent Latitude.*

As Radius : S of the Moon's Altitude :: the S of her Horizontal Parallax : the S of her Parallax in that Altitude and Latitude.



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THE  
YOUNG MAN'S  
Book of Knowledge, &c.

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PART IV.  
OF  
NATURAL PHILOSOPHY, &c.  
SECT. I.

TYRO. **W**HAT is *Philosophy*?

PHILO. *Philosophy* is the Knowledge, or Study of Nature and Morality, founded on the self-evident Principles of Truth and right Reason.

TYRO. What does it principally teach us?

PHILO. *Philosophy* teaches us to search after Truth itself, has its Rules, Laws or Axioms built upon right Reason, and therefore instructs us in the Knowledge of the *Nature, Causes, Properties, and Effects* of Things in general.

TYRO. What do you mean by the *Nature* of Things?

PHILO. That established Order or Course; that essential Property, by which Things are distinguished from each other: Or it is a Series of second Causes, which the all-wise and eternal Creator has impressed upon Matter in all Bodies and Substances whatever.

TYRO. Be so kind as to explain what you mean by secondary, or second Causes, for I do not apprehend it. Is not a Person that does a Thing, or causes it to be done, the real Cause thereof?

PHILO. In many Cases it may with Propriety of Language be said so; but philosophically it is not so; nor will the Laws of Philosophy allow but one Cause, the Rest, or Result of the first, being only Effects thereof.

TYRO.

TYRO. I am not quite clear in this yet. — Suppose you were very cold, and I kindle you a Fire, by which you are comforted; or in any Distress, of Debt or Danger, and I deliver you, am not I the Cause of all this?

PHILO. I told you before, that in Language you may be said to be so; it would look pedantic to express it otherwise, and my Thanks are certainly due to you, at all Times and in all Places: But notwithstanding this, as you were not the *primary* Cause of these Things, I should only call you a secondary Cause, or an Effect of the *first moving* Cause.

TYRO. Why so?

PHILO. Because you could not have kindled the Fire without such Matter suited thereto, which causes that Sensation in us, &c. Again, you cannot pretend to be the real Cause of delivering me from Debt or Danger, till you had both Power and Inclination; for had you Ability, you might want Inclination; had you Inclination, if you had not Ability you could not execute your Design without some further Assistance, which may be called a third Cause or Effect; and so on to ten thousand. These, however, depending on each other for Power, Ability, Interest, Disposition, &c. are all called second Causes; but even you, who were the first of these secondary Causes, neither did, nor can give yourself such Power, Ability, Disposition or Inclination, therefore you are only a secondary Cause in all the Actions, and are, with me, indebted to God, the *primary* Cause; but with this Difference, that you are indebted for that Power and Inclination, but I am (by the Laws of *Philosophy* and right Reason) indebted to both; to *Him*, as the real Cause, and to *You*, as the Instrument or Effect thereof.

Thus, you see, every Thing or all created Beings are but Effects or secondary Causes, though the Word is used with Propriety without such Distinction. Thus we say, the Sun is the Cause of Vapours; Vapours the Cause of Clouds; Clouds of Rain; Rain of Springs, Rivers, &c.

TYRO. I thank you, Sir, I understand you quite well; but pray what do you mean by the *Property* or *Properties* of Bodies or Beings of any Sort?

PHILO. The *Properties* of Bodies are those Qualities, Productions, and Operations peculiar to each Body, and by which one is more particularly distinguished from another: Thus it is the Property of God the *primary* Cause to be no other than good, merciful, unerring, &c. But of the Devil, or damned Spirits, to be always bad, unmerciful, implacable, &c. It is also the Property of Man to think, to reflect, to laugh, to grieve, &c. The Property of Glass to be transparent and brittle; of Fire to burn or destroy; of the Wind to be cool and invisible, &c.

TYRO. Pray what is an Effect ? is it the same as a secondary Cause, for you seem to have made very little or no Distinction ?

PHILO. In Respect of the *Primary* Cause, all other may be called Effects ; but to speak of the Action of secondary Causes, they all have their Effects also. Thus congealed Water or Ice, is the Effect of a severe cold Air ; a *Thaw* the Effects of the Air being so warm as to melt it ; a good Harvest the Effect of Industry, and seasonable Weather ; a miserable Life and Death the Effects of Vice ; a comfortable Life, the Effects of Ease and Plenty ; and a blessed and happy End, the Effects of Virtue, Content and Resignation, &c.

## S E C T. II.

*Contains a farther Definition of Philosophy, with certain Rules of philosophizing.*

TYRO. What is farther necessary to be known to attain to the Knowledge of Natural Philosophy ?

PHILO. There are certain Axioms, Rules, or self-evident Principles upon which this Science depends ; and of which you may soon make yourself Master, by reading them a few Times over ; and if you observe them well you cannot be led into Error by them, because they are self-evident Truths.

TYRO. Please to let me hear them, and if there be any Thing difficult in them, please to define them, because I may not immediately apprehend them.

PHILO. I will.

### A X I O M or R U L E the I.

Nothing has no Properties ; that is, Nothing, Non-entity, or Negation of Being have no Existence, therefore can have no Property.

### A X I O M II.

Something doth exist ; then every real Thing has, or is endued with some Property or Properties, because it exists.

### A X I O M III.

There is no Medium between Existence and Non-Existence, between Something and Nothing ; for a Thing must be or not be ; and it is impossible it should be and not be, at one and the same Time.

### A X I O M IV.

Nothing can never be made into Something ; that is, Something, never can be produced out of Nothing ; for Nothing has no Properties, by Axiom I.

### A X I O M V.

Something can never be reduced to Nothing ; that is, no Substance

*stance or Being can be really annihilated, or reduced to a State of Negation. This is very clear from Axiom I. and III.*

## A X I O M VI.

*That which exists of itself, is independent, and consequently all other Beings, or Substances, are dependent thereupon, and are but Effects thereof\*.*

## A X I O M VII.

*Whatever is not the real Cause of an Effect, can be no other than a secondary Cause, and as such must be dependent, therefore is itself no other than an Effect, by Sect I.*

## A X I O M VIII.

*Every Thing in Nature, after its Creation, would for ever continue in that State and Position of itself, were it not for some Cause acting upon it to alter either the State, Condition, or Position thereof. Therefore,*

## A X I O M IX.

*Every Change is produced from some Cause or other.*

## A X I O M X.

*Natural Causes produce natural Effects, but they can never of themselves produce supernatural ones; but a supernatural Cause may produce Effects of every Kind.—*

N. B. This may at first appear absurd to a critical and quibbling Philosopher, but I believe it will not be thought unnatural from the Nature of God and the Law of Nature itself.

## A X I O M XI.

*All and every Change in any Body will always be in Proportion to the Power or Force of the Cause acting upon it.*

\* The Atheist, Fatalist and Free-Thinkers are very fond to keep up to the strict Rules of *this*, and Axiom 4 and 5, and draw curious and unnecessary Arguments from them, in order to overturn or lessen every Thing tending to the Belief of the Self-Existence of God, and weaken the System of revealed Religion. The Fatalists call God's Omnipotency in Question, and say, Matter is eternal, according to Axiom 1st and 4th; but admit the Being of God cannot be self-evidently proved by the Laws of Philosophy. What then? Must we deny every Thing that we cannot comprehend?—We know that there is a Circle and a Square, but the real and true Proportion to each other is not known, nay, is in itself contradictory, and so are many other Things in Nature. If then we cannot comprehend *this*, and many other Things that daily present themselves to us; is it not vain to search after those that we never can comprehend? and is it not as equally absurd to deny their Nature and Existence, because they are far beyond the Reach of Man's shallow Capacity?

## A X I O M



## AXIOM XII.

*Nature acts constantly in an uniform Order to itself; doth nothing in vain (by Axiom 10.) We must from hence then assign the same Reason and Causes for Heat in Water, as in Fire, and that of Respiration in Beasts and Insects as in ourselves, &c.*

N. B The Qualities and Properties of Bodies, are not known by mere Hypothesis, therefore Recourse must be had to Experiments in many Things, which seldom fail to give us a sensible Satisfaction. Those therefore, who have Time and Opportunity, would do well to peruse Dr. Derham, Dr. Desaguliers, Mr. Rowning's, or Mr. Martin's Natural and Experimental Philosophy.

Do you apprehend these Axioms?

TYRO. I think they are very easy to be understood.

PHILO. Then we will proceed to

## S E C T. III.

*Of Matter in general, with a short Account of some of its most material known Properties;*

TYRO. What is *Matter*?

PHILO. A hardy, massy, divisible and moveable Substance; the Essence or first Principle of all natural Things; and from whose Arrangements and various Combinations of Particles, arise the different Bodies of the Universe.

TYRO. Is the intimate, inmost or internal Nature of Matter known?

PHILO. No, it is not; but some Properties belonging thereto are known to us, and it is evident the primary Particles or Atoms of Matter are the same in all Bodies.

TYRO. Is Matter *finite* or *infinite*?

PHILO. *Finite*, because it is limited within certain Bounds.

TYRO. How is Matter considered in every Body?

PHILO. Under the three Denominations, of *Length*, *Breadth*, and *Depth*, or *Thicknes*s, the proper Names applicable to Solidity or any solid Body.

TYRO. Have all Bodies Properties alike?

PHILO. No; but there are certain Properties common to all Bodies; and others have their peculiar Properties.

TYRO. Pray tell me what Properties are common to all Bodies?

PHILO. Every Body has at last five common Properties, viz. 1. *Extension*; for all Bodies fill, or take up some certain Space, and may be extended. 2. *Divisibility*; for all Bodies may be divided into two Parts, those two into four, and those four into eight, &c. *ad infinitum*, or for ever. 3. *Figurability*; for there is no Body or Thing without some *Shape* or *Figure*.

4. *Mobility*; for all Bodies are capable of being removed into another Situation. And, 5. *Solidity*; for the internal and external Particles of all solid Bodies are hard, and act upon one another in such a Manner as to form Figures of various Shapes and Dimensions.

TYRO. I understand you well, Sir; but please to inform me what Bodies have their peculiar Properties?

PHILO. The peculiar Properties belonging to certain Bodies are as follows, viz. 1. *Gravity* and *Levity*. 2. *Attraction* and *Electricity*. 3. *Transparency* and *Opacity*. 4. *Density* and *Rarity*. 5. *Hardness* and *Softness*. 6. *Rigidity* and *Flexibility*. 7. *Consistence* (or *Thickness*) and *Fluidity*. 8. *Heat* and *Cold*. 9. *Humidity* and *Siccidity*. 10. *Elasticity*. 11. *Odours* and *Sapours*. 12. *Light*. 13. *Colours*; and 14. *Sound*. Of these is their Order.

#### S E C T. IV.

*A Definition of the first five common Properties, Extension, Divisibility, &c.*

##### 1. Of EXTENSION.

TYRO. What is *Extension*?

PHILO. *Extension* is the Distance between the extreme Particles of a Body, taken from any Part of the Surface, to the opposite Part thereof; and by this *Extension*, the Shape, Size, Dimension or Magnitude of any Body is measured or known.

TYRO. What do you mean by *Magnitude*?

PHILO. It is the same as Size or Bulk; but in *Philosophy* it means the Quantity of Space that any particular Body fills or takes up, which is the just and true *Magnitude* or Dimensions thereof.

##### 2. Of DIVISIBILITY.

TYRO. What is *Divisibility*?

PHILO. It is the Act of dividing, or is the Property or Quality of Bodies capable of being divided into Parts, either mentally or actually.

TYRO. I think I understand you; you mean, no Body or Particle of Matter is so small but it may still be divided into two Parts.

PHILO. I do; and not only into two Parts, but those two into four; and those four into eight, and so on for ever and ever.

TYRO. This is vastly surprising, and one would think incredible.

PHILO. It is very evident; that a Particle of Matter, though ever so small, is capable of being divided into as many Parts as there are Sands of Sand on the whole Surface of the Earth; nay, more so; for the Grains of Sand are finite, within the Limits of Space and Numbers, but a Grain may be divided infinitely.

TYRO:

TYRO. If the least Particle is capable of infinite Division, what then must the largest Mountain be?

PHILO. You make me smile, that you have so innocently discovered yourself to be but a TYRO: For if the least Grain of Sand is capable of infinite Division, (as it is) the largest Mountain can but be so.

TYRO. I ask Pardon for my Inconsideration; but however, I should be glad if I could see you demonstrate it, if you possibly can.

PHILO. That I will, and nothing is more easy to be understood: For let NO be a right Line, and PQ drawn parallel thereto, and draw also RS perpendicular thereto, which is to represent any Particle of Mat-



ter to be divided; then draw right Lines from N to *n*, *o*, *p*, Q, which will cut or divide the Line RS into four distinct Parts. Now let us suppose the Line PQ to be infinitely extended; then it is evident, that there might be an infinite Number of Points taken between S and Q: Consequently then, Lines drawn from N to those infinite Points would cut or divide RS infinitely or for ever.

TYRO. I understand you now very well, but still I am amazed, and can hardly find myself inclined to credit it, or assert what I know to be true.

PHILO. I don't at all wonder at it; but it will surprize you more if I should tell you, that the least Particle of Matter, after it has been thus divided, is capable of such Extension as to fill or cover not only the Face of our Globe, but even the Surface of the greatest Planet in our System, so as no Pore thereof shall be void.

TYRO. This is so incredible, that I dare say you will have few Disciples to believe it!

PHILO. I suppose so; but it is very evident from the very Nature of Matter, and the unaccountable Minuteness of its Particles.

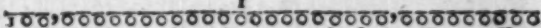
TYRO. Can you give me any further Satisfaction on this Head?

PHILO. Not demonstratively, for I think that has been sufficiently done: But perhaps you may be cured of your first Surprise, in surprizing you further with more Incredibilities, as you call them.

TYRO. I ask Pardon, but I hope my Incredulity will not prevent your communicating every useful Thing to me.

PHILO. Not at all; for I do not wonder at your being surprized, and if we consider the Minuteness and Ductility of Matter, it is astonishing: For Mr. Boyle says, that one Grain of Vitriol will tinge near 30,000 Grains of Water; how very small

small then, must the Particles of this Grain be, to diffuse itself and spread the whole Space of above two Quarts of Liquor.

Again, the learned Dr. *Keill* has demonstrated, that there are actually such small Animaculas or living Insects, that one single Drop of Water will cover 100000 of them; of what *infinite* Minuteness must the Globules of Blood be, which run or circulate through the Veins of these small Creatures, since the aforesaid Gentleman and others have proved, that one of these Globules does not exceed the  Part of an Inch. A Number almost beyond finite Expression or Conception! \*

TYRO. I am obliged to you, and am now satisfied concerning the Minuteness of the Particles of Matter; but pray what do you mean by *Ductility*?

PHILO. Ductility is that Property of Matter belonging to certain Bodies, which is capable of being pressed or beaten out wider, or drawn out longer; and such is the Nature of Gold, that Mr. *Boyle* says, that *one* Grain only may be beaten into a Plate or Leaf containing 50 Square Inches (which is upwards of seven Inches every Way in the Leaf) and therefore one Pound will cover a Room 2000 Feet Square according to this Proportion.

TYRO. Surprising indeed! And pray what is the next Thing or Property you observe in Bodies?

PHILO. That Property commonly call'd

### 3. Of SOLIDITY;

TYRO. What do you mean by *Solidity*?

PHILO. Solidity is that Property by Means of which one Body resists another, and tries to keep its own Station or Situation, though pressed upon or against on all Sides; and in some Cases it is call'd *Impenetrability*, or impenetrable Solidity.

TYRO. Have all Bodies then this Property?

PHILO. Most certainly; but why do you ask such a Question?

TYRO. Because I thought it was only peculiar to some Bodies, as Iron, Steel, Stone, Lead, &c.

PHILO. You make me smile again; is it not evident, that Air and Water are very great Resisters? and you know very well, that a Drop of Water or Particle of Air placed between any two Bodies will really hinder their Contact or uniting, the same as if there were the same Quantity of Steel or any hard Body between them.

\* See *Keill's Astronomy and Natural Philosophy*, *Martin's* and *Rowning's Philosophy*, under the Articles of Divisibility and Light. *Philosophical Transactions*, N<sup>o</sup> 194.

TYRO.



TYRO. In what does the Shape or Modification of Matter consist?

PHILO. In the Form of all the extreme Parts of a Body, on the various Parts of its Surface, by which we determine the Shape or Shapes thereof, and is therefore call'd *Figurability*, or the Shape, Mode and Form of a Body?

TYRO. How do the inward Parts act upon one another to cause such a Form?

PHILO. This is not easy to account for; but, however, we shall say more upon this when we come to speak of *Cohesion*.

#### 4. Of MOBILITY.

TYRO. What do you mean by *Mobility*?

PHILO. It is that Property of a Body which is capable of Motion, or being moved.

TYRO. What is *Motion*?

PHILO. The continual Change of any Body from one Place to another, or that State and Condition which is never at Rest.

TYRO. What do you mean by *Rest*?

PHILO. Cessation of Motion, or the Continuance of a Body in one Place or State.

TYRO. What is the Cause of Motion?

PHILO. Some external Force or Power, which acts upon the Body at rest, and drives or moves it out of his Place.

TYRO. What is *absolute Motion*?

PHILO. The real Change or absolute Place of any moving Body.

TYRO. What is *relative Motion*?

PHILO. Is the Change of Place in respect of Bodies at rest, for a Body may be at rest and yet may be in a relative Motion.

TYRO. How do you make this appear?

PHILO. Very easily; for when we are in a Ship that is sailing, though we sit still, yet we are in Motion, and so we are perpetually by the annual and diurnal Motion of the Earth; but this being a Motion which is not felt, is call'd *insensible* or *relative Motion*.

TYRO. I understand you well; and pray is there any Thing further to be observed concerning the Nature and Effect of Motion?

PHILO. Yes, there are three Divisions, Properties or Affections in Motion, *viz.* 1. Celerity or Velocity; 2. Quantity; and, 3. Direction.

#### S E C T. V.

*Of the Celerity, Quantity, and Direction of Motion.*

TYRO. What do you mean by *Celerity* or *Velocity*?

PHILO. Swiftneſs, or Rapidity; and in Philosophy it means that Degree of Swiftneſs by which any Body paſſes over a given Space

Space in any certain Time; as suppose one Body was to pass over a certain Space, and another was to pass or run through the same in half the Time, then the Celerity of the last would be double the first, *viz.* would move as quick again.

TYRO. I understand you; and pray how do you compute the Quantity of Motion?

PHILO. By the Quantity of Matter and the Velocity compounded.

TYRO. I don't at present understand you.

PHILO. Observe then: Suppose one Body to have 4 Parts of Matter and 5 Degrees of Velocity, and another Body has 2 Parts of Matter and 10 Degrees of Velocity, then the Motion of both would be equal, for  $4 \times 5 = 20$  and  $2 \times 10 = 20$ . But if one has 2 Parts of Matter and 4 Degrees of Velocity, and another 6 Parts of Matter and 8 Degrees of Velocity; then the Quantity of Motion in the first will be to the Quantity of Motion in the second as 8 to 48; for  $2 \times 4 = 8$  and  $6 \times 8 = 48$ .

TYRO. I am obliged to you, kind *Philomathes*; and I can plainly see by what you have shewn me, that if the Quantity of Matter and Velocities of any two Bodies are equal, their Quantity of Motion will be equal also; but if either the Quantity of Matter or Velocity be not equal in each, then their Motion will also be unequal.

PHILO. You are very right, *Tyro*; but still you must remember, that when the Quantities of Matter and the Velocity are in reciprocal or mutual Proportion to each other, then their Motion will be equal: Thus, suppose 8 : 4 :: 12 : 6; that is, the Motion of a Body whose Quantity is 8, having 6 Degrees of Velocity, is equal to the Motion of another Body whose Quantity is 4 with 12 Degrees of Velocity; for  $8 \times 6 = 4 \times 12$ .

TYRO. I thank you, Sir, for this kind Hint; but pray what do you mean by the *Direction* of Motion?

PHILO. *Direction* is an Impulse or Force of one Body acting upon another, which is called *single Direction*; but if two Bodies act upon any single Body, it is called *compound Motion* or *Direction*.

TYRO. Please to explain this a little further to me.

PHILO. Single, *simple* or direct Motion, is when a Body is moved out of its Place by a certain Impulse, and will of itself (after such Force acting upon it) move continually in that Direction in which it first set out, or was acted upon, except it meets with any Obstruction.

TYRO. What is *compound Motion*?

PHILO. When two or more Bodies act upon any single Body by contrary Directions; for Instance, let a String be fasten'd to a Ball, and laid on a smooth Table, it is evident that if I pull, the Ball will come to me in a direct Line, without it meets with

any Obstruction or second Force or Impulse. 2. If another Person has a second String fasten'd to the Ball, and he stands in a right Line with me, and both pull ever so easy, or ever so hard, provided we pull with equal Force, the Body or Ball can never stir; but, 3dly. If the other Person directs his String in a right Angle to mine, and we pull both equal, the Ball will then pass in the diagonal Line of a Square, and when it rests will be equidistant from us, and the Velocity will also be swifter; for the Body being acted upon by two Powers, will pass through a Line or Space whose Square will be equal to the Squares of the Distance of both Powers from the Ball. Do you understand me?

TYRO. I can't say I do.

PHILO. Observe then: Suppose the two Strings fixt as aforesaid, and we both give a sudden Pull, Snatch or Impulse, you with 3 Degrees and I with 4 Degrees of Force, then I say, the Ball will fly in a diagonal Line or Direction, will have 5 Degrees of Force, and will pass over the diagonal Line of the Square in the same Time, that it would pass to us by either of our single Powers acting upon it. This is plain (from Figure the 12th, Page 159) for suppose the Ball to be at A, you act upon it at B with 3 Degrees, I act upon it at C with 4 Degrees of Force, then I say the Ball will fly in the diagonal Line A D, with 5 Degrees of Force, and in the same Time as it would arrive singly from A to B or to C: For  $3 \times 3 = 9$ , and  $4 \times 4 = 16$ ; now  $16 + 9 = 25$ , whose  $\sqrt{\quad}$  is  $= 5 = A D$ . See Figure 2d, Page 170.

TYRO. Now I understand it perfectly well.

PHILO. I am glad of it; then we will proceed to give you some Account of other Properties respecting certain Bodies.

## S E C T. VI.

### *Of Gravity and Levity, Attraction and Electricity.*

TYRO. What do you mean by *Gravity*?

PHILO. *Weight*; alio the Power or Property of Bodies by which they naturally descend or tend down towards the Center of the Earth, commonly call'd the Center of *Gravity*.

TYRO. What is the Difference between *Gravity* and *Weight*?

PHILO. Some have asserted, that *Weight* and *Gravity* are the same, but it is evident that *Weight* is only the Effect thereof.

TYRO. What are the different Sorts of *Gravity*?

PHILO. *Gravity* is divided into two Sorts, viz. *absolute*, and *relative* or *specific Gravity*.

TYRO. What is *absolute Gravity*?

PHILO. *Absolute Gravity* is the whole Force or Power of a Body, whereby it tends towards the Center of the Earth.

TYRO. What is *specific Gravity*?

PHILO.

PHILO. *Specific Gravity* is peculiar to certain Bodies, and distinguishes them from others when compar'd together: Or it is frequently taken for or call'd that Excess in one Body compared with the Quantity or Bulk of another.

TYRO. How do you compute or measure *Gravity* in different Bodies?

PHILO. By the Quantity of Matter contained in them, for the Proportion will always hold good between them.

TYRO. This then is the Reason, I suppose, that heavy Bodies descend sooner or with greater Velocity than light ones.

PHILO. Not at all, *Tyro*; for the Property of *Gravity* is such, that its Power or Force acts upon all alike without any Distinction of Size or Weight.

TYRO. How can this be? Is it possible a Feather should descend or fall 20, 40, or 60 Inches, Feet or Yards, so soon as a Pound Weight of solid Lead, Iron? &c.

PHILO. Yes it would, if it were as many Miles, were it not for the Resistance of the Air which acts so forcibly upon the Feather and retards its Descent; but where there is no Air, that is, if the Air can be exhausted, the Feather would fall or descend in the same Time, and with equal Velocity with the Pound Weight, as is evidently proved by the *Air-Pump*, out of which when the Air is exhausted, both would equally descend with incredible Swiftness to the Bottom.

TYRO. Then I perceive it is not the Weight of Bodies, but the Power of Attraction over different Bodies; for every Particle of Matter, I see, is acted upon by an equal Force of Gravity, only it requires a greater Force of Attraction to move the heavier Body.

PHILO. You are right; for all Bodies gravitate towards each other, the Earth gravitates towards the Stone or Weight which is falling or descending towards it, as much in Proportion as the Stone to the Earth, only the Bulk and Quantity of Matter is so great that we cannot perceive the Motion of one like that of the other.

TYRO. Pray is there any determining the Time of the Descent of Bodies falling perpendicularly, or knowing with what Degree of Velocity they fall?

PHILO. Yes; for the perpendicular Descent is about 15 Feet in a Second of Time, and for all other following Seconds, the Spaces are as the Squares of those Seconds; thus let the Seconds be 1, 2, 3, 4, &c. then their Squares will be 1, 4, 9, 16, &c. and the Spaces passed through will be 15, 60, 134, 240, &c. and the Number of Feet will be as the Multiplication of the odd Numbers, 1, 3, 5, 7, &c. that is, 15, 45, 75, 105, &c. Or thus; the Spaces Bodies fall through are equal to the Squares of their Times: Thus a Body will fall 4 Times as far the 2d Minute as the 1st, because



because  $2 \times 2 = 4$  and  $3 \times 3 = 9$ , &c. therefore the Distance of falling will be 3 Times as far in the 2d Portion of Time as in the 1st; 5 Times as far in the 3d, 7 Times as far in the 4th, &c.

TYRO. I thank you, Sir; but if this be the Case in Bodies descending to increase, do not Bodies ascending decrease in Proportion?

PHILO. No doubt of it, for it is plain the Force is decreased as it rises, and the Law of Gravity perpetually destroys the Ascend: For if a Body be thrown up with any certain Force, so as to continue rising as long again as another Body, it will go 4 Times as high; if it ascends 3 Times as long, it will go 9 Times as high, &c.

## 2. Of Attraction, Cohesion, and Electricity.

TYRO. What do you mean by *Attraction*?

PHILO. *Attraction* and *Gravity* are often expressed for one and the same Thing, and are used indifferently for the same Circumstance in common Expression; but yet there is a sensible Difference, for *Gravity* is the natural Tendency of all Bodies towards the Center of the Earth in their Descent; but *Attraction* is the Tendency of approaching or drawing near; or it is that Property in Bodies by which they affect, gravitate or tend to each other, and this Power or Property is called *Attraction*.

TYRO. I do not rightly apprehend this; I wish therefore you would explain it further.

PHILO. *Attraction* then is considered in two Parts, viz. 1. *Attraction of Gravity*, and 2. *Attraction of Cohesion*.

TYRO. What do you mean by *Attraction of Gravity*?

PHILO. That Power or Property by which Bodies naturally tend to, or approach one another, by a *centripetal* Force, viz. tending to, or being impelled to act towards the Centers of each other.

TYRO. And pray what do you mean by *Attraction of Cohesion*?

PHILO. I must first tell you what *Cohesion* is; and that is the Action of Atoms, or primary Corpuscles of Matter, which act upon each other, so as to form visible or sensible Particles; and then by the Law of *Attraction*, these Particles do so cohere or unite together as to cause the different Shapes of all the Masses or Lumps of solid Bodies, which present themselves to our Sight; but how these Atoms or Particles act upon each other so as to form such and such a Shape, we know not, because we cannot account for the Actions of the different constituent Parts of a Body so formed by the Cohesion of such Particles\*.

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\* Many are the surprizing Effects of the Laws of *Attraction*, and those whose Curiosity would lead them further into the Knowledge of these Things, may consult *Martin's Phil. Gram. Rowning*, and other

TYRO. I am highly obliged to you, kind *Philomathes*, and pray now give me Leave to ask you: what you mean by *Electricity*, and wherein it differs from *Attraction*?

PHILO. *Electricity* is that Virtue, Property, or Faculty of certain Bodies (such as *Amber*, *Glass*, *Sealing-Wax*, &c.) that when rubb'd for some small Time, will, by the Power of such *Attrition*, *Friction*, or *Rubbing*, attract all light Bodies, such as Hairs, Feathers, &c. at a very sensible Distance, so as to cohere, or stick to the Body so agitated or rubbed, for a certain Space of Time, according to the Power of *Attrition* given to it; and the larger the Body, and the more the Friction, the further will it attract, and the longer will the lighter Body so attracted stick to it.

TYRO. Then it will leave the electrified Body at last, will it?

PHILO. Yes, most certainly, after the Virtue or Power given to the electrified Body by Friction ceases, and then it is as it were repelled, beat or forced back from the said Body, and will suddenly fly off (sometimes with a Sort of a Snap) but never out of the Sphere of *Attraction*; for by rubbing the Body sufficiently again they will instantly fly to it as if they were compelled back.

TYRO. What may we learn from *Electricity*?

PHILO. Many useful and amusing Things, as, 1. That it consists of, or is compounded both with the Power of *Attraction* and *Repulsion*. 2. *Electrical* or electrified Bodies attract all Things; but the *Load-Stone* acts with very little Power or Attraction on many Things, except Iron or Steel. 3. If a light Feather be within the Power of Attraction of an electrical Body, there it will stick, and afterwards being repelled will fly off to some other Body, but it will always stretch out its Fibres towards the electrical Object.

Many other Curiosities are to be observed from the Nature or Power of *Electricity*; but particularly this, that not only Plants have received fresh Vegetation by it, but even many Disorders incident to Mankind, some very obstinate, and others even said to be hereditary, which have baffled all the Rules and Order of a regular Process of Physics, have been removed by the Persons submitting themselves to be *electrified*.

N. B. Dr. Boyle says, that it is not by Necessity that small attracted Bodies come to be electric ones; for if a Piece of Amber be rubbed strongly on any dry or warm Body of as big Size as itself, and then taken away, and afterwards tied to a String so as to hang perpendicular and

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eminent Authors on this Head; but yet, *Tyro*, be not too curious, for I tell you that even the great Sir *Isaac Newton* himself, though he makes the Law of *Attraction* and *Gravity* to be the very Basis of Philosophy; yet at the same time owns himself entirely ignorant of the real Cause of either.

quite at rest; if the Body upon which the Amber was rubbed be put towards the Amber, the Body so rubbed will draw the Piece of Amber towards it, which plainly shews that other Bodies can move or draw the electric ones. See Dr. *Brown*, Dr. *John Harris*, and *Martin* on Electricity.

#### 5. Of TRANSPARENCY and OPACITY.

TYRO. Pray what do you mean by *Transparency*?

PHILO. *Clearness*, free from *Cloudiness*; and is that Property of Bodies which renders them easy to be seen through, so that any Object may be seen behind them, or appear much the same as if no such transparent Body was placed between the Eye and the Object, though perhaps not quite in the same Size or Magnitude.

TYRO. What is this owing to?

PHILO. To the Nature or Construction of all such Bodies that admit the Rays of Light to pass through them immediately in right Lines; such is the Nature of all *pellucid*, *diaphanous*, or *transparent* Bodies, as *Glass*, *Crystal*, &c. by Reason of their Pores, or small Interstices or Passages between the Particles of Matter contained in them; and these Pores are so great in some of these Bodies (particularly *Glass*) that the Quantity of Matter contained in the Bulk of these Bodies bear scarce any Proportion to the Size or Bulk itself. See Dr. *Keill's* Introduction.

TYRO. I thank you, Sir; and pray what do you mean by *Opacity*?

PHILO. That State or Condition of Bodies which are void of Light, or the Quality of all such Bodies as are dark and opaque, or are not to be seen through.

TYRO. I understand you, Sir, for I see plainly that *Opacity* is a second Darkness, as it were; for though it is not really the Want of *Light*, yet it is Light obstructed which cannot pass through such Bodies in right Lines, as in *transparent* Bodies.

PHILO. You say right, *Tyro*; but you are to observe that the small Particles of opaque Bodies will become transparent in Liquids, or otherwise by filling their Parts or Pores with any Substance equal with the Density of their Parts. See Dr. *Keill's* Introduction.

#### 4. Of DENSITY and RARITY.

TYRO. What do you understand by *Density*?

PHILO. *Density*, according to the common Acceptation of the Word, signifies Thickness, Solidity, or Compactness; but philosophically, it is the Property of a Body, which arises from the Closeness of its Particles and Smallness of its Pores, by which it contains such a Quantity of Matter under such a Bulk: And therefore, in comparing one Body with another, we say, such a one is more *dense* than the other, which is more *rare* or thinner.

TYRO.

TYRO. Then I see that *Rarity* is only *Thinness*, or is quite opposite to *Density* or *Thickness*.

PHILO. You are right,

TYRO. What may we learn from hence?

PHILO. Several useful Things. 1. If two Bodies have the same *Densities*, their Masses are as their Bulks. 2. The *Densities* of any two Bodies are in a Ratio compounded of the direct Proportion of the Quantity of Matter in their Masses, and a reciprocal Proportion of the Magnitude of such Masses.

TYRO. Pray explain this a little clearer.

PHILO. Suppose then there were two given Bodies A and B; A has 6 Parts of Matter and 4 Degrees of Magnitude; and let B have 3 Parts of Matter, and 12 Degrees of Magnitude; I say then, that A's *Density* is to B's as 5 to 1; that is, 5 Times greater than B's.

TYRO. How do you prove this?

PHILO. Place the Numbers Fraction-wise, but always observe, that the Parts of Matter must be made one Fraction, and the Magnitudes of each another Fraction, but so that the Degrees of Magnitude which belong to the given Body must stand athwart or cross-ways, and not under its own Parts of Matter; or in other Words, the Degrees of Magnitude of the one Body must be a Denominator to the Parts of Matter in the other; then multiply the Fractions together, and compare the Numerator and Denominator, for that gives the Proportion of their *Densities*. Thus in the Question  $A \frac{6}{3} \times \frac{12}{4} = \frac{60}{12} = 5$ , therefore A's *Density* is 5 Times greater than B's.

TYRO. I heartily thank you, kind *Philomathes*, for this plain Demonstration.

PHILO. Then we will proceed to the next Thing, *viz.*

### 5. Of HARDNESS and SOFTNESS.

TYRO. What do you mean by *Hardness*, or wherein does *Hardness* consist?

PHILO. *Hardness*, in Opposition to *Softness*, consists of the most minute primogenial Particles of Matter conglutinated, stuck to, or cohered to each other, in such a Manner, and into such a Firmness or Solidity, that the Pressure of the Finger not being able to make any Alteration on such a Body, so as to displace any of the Parts, or alter its outward Form or Shape, and the different Degrees of *Hardness* arise from such Bodies, whose constituent Particles are flat or square, so as to touch each other in many Points; whereas those which are round or spherical, touch in fewer Points or less Surface, and approach nearer to *Softness* or *Liquidity*.



## 6. Of RIGIDITY and FLEXIBILITY.

TYRO. I apprehend that *Rigidity* and *Flexibility* are much the same as *Hardness* and *Softness*; are they not?

PHILO. No, *Tyro*. *Rigidity* signifies *Stiffness*, and therefore is in Effect the same as *Hardness*; for all rigid Bodies are hard: But *Softness* and *Flexibility* are not the same, for no Body can be soft without being *flexible*, but a Body may be *flexible* and not *soft*; for *Flexibility* does not signify *Softness*, but *Thinness*, or the Nature or Property of such Bodies as are *thin* and *pliable*.

TYRO. I thank you, Sir; and pray what next comes in Course.

## 7. Of CONSISTENCY and FLUIDITY.

TYRO. What is *Consistency*?

PHILO. *Consistency* signifies *Thickness*, and is set in Opposition to *Fluidity*, and is that State or Property of Bodies, whereby they are fixed like those in a State of Solidity, but may be moved or acted upon with greater Ease: It is likewise called *Fixidity* or *Fixity*, and arises from constituent Particles, the same as those of *Hardness* and *Rigidity*, but of a less Degree.

TYRO. What is *Fluidity* or *Fluidness*?

PHILO. That Quality of Bodies, by which the Parts are so disposed as to slip by or over each other, and flow all Manner of Ways, and will contrary to Solidity or *Hardness* give Way to the least Touch or Pressure.

TYRO. What is the Reason or Cause of *Fluidity*?

PHILO. It arises from the Similarity of the original or pre-mogenous Particles of Matter, together with their Lubricity and Smallness, whereby they are so modified as to produce a fluid Body, such is the Property of Water, Oil, Fire, &c.

TYRO. Then I find that *Fluidity* and *Liquidity* are the same?

PHILO. No; there is a very sensible Difference, for *Fluidity* is a general Name for all Bodies whose Parts yield to any Touch or Impression, such as Sand, &c. which is called a *Fluid* as well as Water, &c. but that is called *Liquidity*, or a liquid Body, which when touched leaves a Moisture or Wet upon the Finger.

## 8. Of HEAT and COLD.

TYRO. What is *Heat*?

PHILO. *Heat* is a Sensation of the Mind, the Cause of which consists in the Agitation of the sensible Parts of the Object, which produces in us that Sensation by which we pronounce the Object so agitated to be more or less hot or cold; for it is according to the Activity of the Motion of the Particles of the Bodies; no Heat being sensible to us but such whose Motion of its Parts act stronger upon us, and greater than the Organs of our Body. See *Harris*, *Rowning*, and *Martin*.

TYRO.

TYRO. What is *Cold*, or what do you understand by it?

PHILO. That which is contrary to *Heat*, and void of all the agitated Particles of Fire, and in that State when the Motion of the Parts of a Body, is less than that of the Organ of our Touch or Feeling; then it excites in us such a Sensation as is called *Cold*.

TYRO. I thank you, Sir; but is not *Fire* and *Light* one and the same Thing?

PHILO. No; but the Particles of Light and Fire act alike in many Respects, but yet they are very different; but this I shall tell you more of when I come to treat of *Light*.

TYRO. Very well, Sir; but pray what is *Flame*?

PHILO. *Flame* is a *Fluid*, *Fume*, or *Vapour*, arising from intense or red hot Bodies, by the Particles being inconceivably agitated, but ever in Motion whilst there is any Air; for without Air there is no *Flame*, as appears by a Candle which will not burn in a foul or adust Air, and a Chimney (or any Vehicle or Tube) on Fire is very easily extinguished by stopping the Mouth of it with a Blanket, or any Thing proper to keep out the Draught of the Air.

#### 9. Of HUMIDITY and SICCITY.

TYRO. What is *Humidity*?

PHILO. Moisture or Dampness, which has the Quality or Property of wetting or moistening other Bodies, but not so as to make the wet Particles drop.

TYRO. I suppose then that it may be called *Fluidity*.

PHILO. Not with Propriety, for all *Fluids* will not wet; such as Dust, Sand, Quick-Silver, &c.

TYRO. Then, if I apprehend it right, *Humidity* is a Sort of a Medium between *Wetness* and *Driness*.

PHILO. You are right, for *Humidity* is only a Mixture of Particles left after *Liquidity*, or else some liquid Particles arising, either from Steam or Dampness, upon certain Bodies, so as to make them *humid* or moist.

TYRO. *Siccity* then, I perceive, is the same as *Driness*, and I suppose is only the Want of Moisture; for if a Body should happen to be moist, yet if by the Heat of the Sun or Fire the Particles should be exhausted or driven out by Steam or Vapour, and this Heat keeps still continuing, it will naturally make the Body, so acted upon very dry, crisped, rumpled, or brittle, and I suppose this Property, Quality, or State, may be called *Siccity*.

PHILO. You are very right, Tyro.

#### 10. Of ELASTICITY.

TYRO. What is *Elasticity*, or what does it mean?

PHILO. It signifies Springiness; and is that Property belonging

ing to certain Bodies, by which they return to their former State, Shape, and Position, after they have been put out of such Shape or State. Thus a Stick, Piece of Cane, Whale-Bone, &c. being bent, and letting them go suddenly, will return with great elastic Force and Swiftness to their former State: But of all Bodies, Air is most remarkably elastic; for being compressed, (or pent up, as it is commonly called) by any Power or Force, when such Power or Force quits the Office of acting upon it, then the Air returns with elastic Rapidity to its former Station; but more of this by and by.

TYRO. Are not all Bodies *elastic*?

PHILO. Yes: None are without the Power or Quality of *Elasticity*; but this is in a greater or less Degree according to the Make, Shape, or Nature of different Bodies. For Instance, soft Bodies have little or no sensible *Elasticity*, but the Strings of every common Spinnet or Harpsichord not only shew the Nature of, but the Difference of *Elasticity* in Proportion to their Vibration; for the longest Wire is *elastic* as well as the shortest; but the shortest has many less Vibrations than the longest, and therefore after it is struck resumes its natural State or Position sooner than the other, and flies back with greater Force and Velocity into its original Form; as shall be more fully proved, if we have Room to treat of *Vibration*.

## II. Of ODOURS and SAPOURS.

TYRO. What do you mean by *Odours*?

PHILO. Such Bodies as excite in us the Sense of Smelling; but it is more frequently applied to such Bodies which send forth sweet, fragrant, or perfume Scents.

TYRO. What do you apprehend may be the Cause of these odoriferous Bodies, acting thus upon the Organs of Smelling?

PHILO. It arises, no doubt, from exceeding fine, and insensible Vapours, which fly off from such Bodies floating in the Air, and acting circularly in all Manner of Directions, but more or less according to their *Humidity* or *Siccity*; as appears manifest by Flowers whose Scent don't act upon our Sense of Smelling till we are very near them, but when refreshed by Moistures, or a small Shower of Rain, may be smelt at a considerable Distance.

TYRO. Pray how do these Scents act upon the Organ or Sense of Smelling?

PHILO. The *Effluvia* of these odoriferous Bodies decrease according to the Square of their Distance: Thus, if there is any odoriferous Body (suppose a Rose, &c.) placed 1 Inch, 1 Foot, or Yard, from me, and I smell it to a certain Degree; then let it be removed 2 Inches, 3 Inches, 4 Inches, &c. from me, I say, the Scent of it will decrease in Proportion to the Square of the Distance from the Body:  $1 \times 1 = 1$ ,  $2 \times 2 = 4$ ,  $3 \times 3 = 9$ ,  $4 \times 4 = 16$ , &c.

&c. so that the Scent will be 16 Times less at 4 Inches off than at 1; 9 Times less at 3 Inches off; and 4 Times less at 2 Inches off; and also 4 Times more at 2 Inches off than at 4 Inches off, because the Square of 2 is 4 Times less than the Square of 4.

## 12. Of LIGHT.

TYRO. What is *Light*, and the Occasion or Cause of it?

PHILO. *Light* is that Sensation in the Organ or Sense of Seeing, whereby all luminous Bodies are not only themselves apparent to our Sight, but all other Objects that the Rays of Light act upon, are clear to our Senses or Perception. — The Cause of Light is unknown to the best Philosophers; it is sufficient, *Tyro*, to say, that it existed only by the immediate Word, or Will of the great Creator.—*Let there be Light*—and there was *Light*.—*Light*, no doubt, is produced from Motion; but then as all Motion will not produce Light, nor is productive of Light, it therefore must be rather the Quality of certain Bodies that are of themselves luminous, and have the constant and invariable Property of emitting or sending forth Rays of Light to our Eyes much finer than Air itself; such is the Property of the Sun, a Star, a Candle, and all Sorts of Flame, &c. See Dr. *Halley's* Micrography, Dr. *Harris* and *Rowning*, and *Martin*.

TYRO. What, do you make *Light* then a Body of itself? I thought the Sun was the Fountain or Cause of all Light.

PHILO. You thought wrong then; for it is evident, that tho' the Sun is the most glorious Body of Light that we at present know of, yet it is not the Original of Light itself:—For Light is produced a thousand Ways where the Rays of the Sun have no Connection.—*Light* is produced by a Candle, by every Flame, by a Flint and Steel, nay, even by Friction and Percussion, such as rubbing a Cat's Back, and by many other Things, Ways or Methods.

TYRO. I perceive my Error, and own what you say to be true; and if I understand you, I suppose that all luminous Bodies are made up with an infinite Number of Particles of such Matter which are indued with, or have the Property or Quality of *Light*.

PHILO. You are right.

TYRO. Does not *Light* fly with incredible Swiftnefs?

PHILO. Yes, it flies above 1500000 one Million 5 hundred thousand Times faster than a Bullet from the Mouth of a Gun or Cannon, and about 750000 seven hundred and fifty thousand thousand Times faster than Sound.

TYRO. This is incredible indeed! But pray, dear *Philo*, give me a little farther Satisfaction of this amazing Swiftnefs.

PHILO. It is proved by several Observations, that Sound flies about 1142 Feet in a Second of Time (but suppose 1140) and a Bullet



Bullet flies about 622 (but suppose 620) Feet in a Second of Time, therefore, as the Sun is about 81,000,000 Million of Miles Distant from the Earth (which is about the same Distance of Half the Diameter of the Earth's Orbit) a Cannon-Bullet would be upwards of 31 Years in passing or arriving from the Earth to the Sun; but *Light* flies from the Sun to us in about  $7\frac{1}{2}$  Minutes.

TYRO. How do you prove this?

PHILO. It is proved by several Observations, but more particularly by the Eclipses of the *Satellites of Jupiter*; for when the *Earth* is between the *Sun* and this Planet, those Eclipses will happen between 7 and 8 Minutes sooner, than when the Earth is in the contrary Position, for then Light has got to fly the Diameter of the Earth's Orbit more, which is about 162000000 Miles more than before. This plainly proves that *Light* is progressive or propagated in Time, and not instantaneous, as was supposed by some antient Philosophers.

TYRO. I am much obliged to you; but what other Properties or Affections has *Light*?

PHILO. Many, for it is plainly proved long ago, that it is the very Cause of those different Colours which appear to us, and are call'd by the various or distinct Names of *Red, Yellow, Green, &c.* which I shall tell you more of when I come to treat of Colours. *Light* also is *reflexible* and *refrangible*.

TYRO. What do you mean by *reflexible*?

PHILO. *Reflexibility* is that Disposition of the Rays of *Light* by which they are thrown back, or turned from their natural Course.

TYRO. What is *Refrangibility*?

PHILO. *Refrangibility* is the Disposition of Rays capable of *Refraction*, or being turned out of their Course by passing into a denser Medium.

TYRO. Can you give me some Examples concerning *Reflexibility* and *Refrangibility*?

PHILO. I have not Room for this, because it requires not only Words but great Demonstrations by Figures; but there are many very curious Things to be observed in the Nature of Vision; and though we see Objects plainly, yet they are not always in the very Place that we see them with our Eye, for sometimes we see them by Reflexion, and sometimes by Refraction.

TYRO. Why, how can this be! — What, if I see an Object plainly in a certain Place, am I to be convinced it is not in that Place?

PHILO. I hope so; for if it be made appear that you are deceived, certainly you would not dare to deny Truth itself upon Experiment.

TYRO. Pray then tell me how this is.

PHILO.

PHILO. We are deceived many Ways by the Laws of Reflexion, and Things appear to us not as they really are. For Instance, take a Tub, whose Sides are strait, and in the Middle on the Bottom lay a Shilling, or any other visible Object, then go backwards so far that you can but see the Object, there stand while another Person fills the Tub above half full with Water, then you will not see the Shilling where you saw it at first, but it will appear perhaps 1, 2, 3, 4, or 10, 12, or 20 Inches further than it did before: (This is according to the Largeness of the Tub and Quantity of Water.) Or others, if you walk so far backward before the Water is poured in, so that you cannot see the Shilling on account of the Edge of the Vessel or Tub; then let it be filled as before, and you will see the Shilling quite plain, but it will not appear to be in the Middle of the Tub where it really is, but will appear as if it were many Inches further from you, and toward the further Side of the Vessel.

TYRO. This is very strange; pray what is this owing to?

PHILO. From Rays, or from a Ray of Light which passes from the Shilling towards the Surface of the Water, but there, meeting with the Air, is refracted out of its Course, and strikes the Eye; and as all Bodies are seen in a strait Line, so you will see the Object, but yet not in its Place. From this very Thing, or on the Account of Reflexion and Refraction, the Sun is seen every Day, Morning and Evening, above the Horizon, when he is really below, or had been below it  $3\frac{1}{2}$  Minute upon a mean Rate daily.

TYRO. I suppose then you mean thus, that though the Sun is really set, his Rays strike against the Atmosphere, and from thence are refracted and pass to the Eye of a Spectator then upon the Earth, and as Objects are seen in right Lines, a Spectator on the Earth will then see the Sun appearing above the Horizon, when he is really below it.

PHILO. Yes, I do.

TYRO. What else is to be observed from Reflexion of the Light, or the Deception of Sight in viewing Objects?

PHILO. Yes, 'tis worthy Notice to observe, that if an Eye were placed perpendicularly over the Shilling which we were just now speaking of in the Vessel of Water, the Spectator then will not see the Shilling or Object at the Bottom of the Tub as it really is, but it will seem elevated perhaps one third, perhaps half the Depth of the Water, as if the Water bore it up, and yet we are sensible the Shilling is at the Bottom.

TYRO. This is very pretty indeed: I intend to try this small Experiment the first Opportunity.

PHILO. Do so; but first, if you can, consult *Martin's Philosophy*, p. 67 and 69, and *Rowning's Philosophy*, Part III. p. 100 and 134.

TYRO. I heartily thank you, kind *Philomathes*; permit me  
B b to



PHILO. It is observed, that there are different Species of Rays of *Light*, which have different Degrees of Refrangibility, in passing from one Medium to another, and according to this Refrangibility or Disposition, they act upon us so as to cause *red, green, blue, &c.*

TYRO. This is very strange; but I am not fully satisfied yet, why such *Colours* appear to us under such Names as *red, green, &c.* except I can have a more sufficient Proof of it: You'll excuse the Freedom, *Philomathes*, I make no doubt; for you desired I would not be backward in asking Questions; and your Charge to me was always to be satisfied with, and clear in all your kind Instructions.

PHILO. I own it, and I am pleased that you do so much Justice to yourself. Observe then, there are certain Species of the Rays of *Light*, each is so disposed to excite in us the Idea of a different Colour.

TYRO. What do you call the principal or primary Colours, from whose intermediate Spaces the other Variety may be produced and accounted for?

PHILO. The Rays of *Light* being refracted, will produce, 1. *Red*, 2. *Orange*, 3. *Yellow*, 4. *Green*, 5. *Blue*, 6. *Indico*, and 7. *Violet*, and these colours are distinguished according to the Refrangibility of the Rays. Thus the least refrangible Ray will appear *red*, and the greatest refrangible Ray will be the very deepest *Violet*, and the intermediate Colours between them will be the other Colours before-mentioned, or a Mixture of those different Colours approaching, more or less, to each Colour, according to the nearest or farthest refrangible Ray.

TYRO. Sir, I am obliged to you, and I perceive my Mistake, for I used to think that Colours were natural to certain Bodies; but now I plainly see that they appear so, according to the different Rays of *Light* painted upon, or capable of being received by them to cause such Colours to effect our Sight.

PHILO. You are right; but I will satisfy you further by an Experiment, which you may try at any time. That is, only to make a Lather with Soap and Water, then take a Pipe (that we commonly smoke in) and fill the Bowl full, and gently blow at the End, and you will find Bubbles arise which you may blow off at Pleasure (as Children do) or suspend them on the Top of the Bowl; then let two, three, or more Persons carefully observe the different Colours of those Bubbles as they arise from the Bowl of the Pipe (which is supposed to be done when the Sun shines) and they will perceive first *Red*, then perhaps *Blue*, and by a Continuance of blowing or raising the Bubble, or depressing it, then will appear *Orange, Green, Blue, Violet*, and in short here and there all Manner of Colours, then will appear for a while a *Yellow*, then *White*, and at last a Sort of *Black*.

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TYRO.



TYRO. You are very obliging, my dear *Philomathes*, but since you have mentioned *Black* and *White*, pray give me some Account of them, for I'm at a Loss how to define them.

PHILO. *Black* and *White* are never reckoned among the primary Colours; because *Black* cannot with any Propriety be called a Colour, it being a Deprivation of all Light, for the Substance absorbeth or sucks up all the Rays, and therefore can reflect none. Now *White* may be called a Colour, because in this are comprehended all the primary Colours in one.

TYRO. I don't understand this, Sir, at all; what if I mix all the Colours together would they be *White*?

PHILO. Doubtless they would.

TYRO. Pray *Philomathes*, give me a Demonstration.

PHILO. I could prove it to you by many Experiments, but this one will be sufficient to convince you, and being very easy you may try it at Leisure.

It is found by Experience, that any Body being divided into 360 equal Parts on which the aforesaid Colours fall, that the *Red* Colour will take up 45 Degrees or Gradations of such Parts; *Orange* 27; *Yellow* 48; *Green* 60; *Blue* 60; *Indico* 40, and *Violet* 80 = in all to 360. Now, take a Wheel, and paint the Circumference with 45 of *Red*; 27 of *Orange* Colour, &c. as aforesaid; then let the Wheel be turned very swift round, and none of these Colours will be seen, but the whole Circumference will appear as if it were painted over with the very best *White*.

TYRO. Vastly easy to try, and very surprizing to consider; but suppose I do not divide the Circumference just in the Manner or Proportion you directed; how then?

PHILO. Then you will not have a perfect *White*, nor will you have any one of the Colours before mentioned, but a Variation of Colours according to the Proportion of each Colour promiscuously laid on, which will partake part of one Colour, part of another, like the Bubble blown out of the Tobacco Pipe. If you would be fully satisfied in this Theory of Colours, see Dr. Harris's Lexicon, Derham's and Rowning's Philosophy.

#### 14. Of SOUNDS.

TYRO. What is the Cause of Sounds?

PHILO. Sounds are Causes by the undulatory Motion of the Air when the Particles thereof are put in Motion by a Stroke on Bodies, which causes first of all a tremulous Motion in them, and then by Means of the undulatory Motion of the Air beats upon the *Tympanum* or Drum of the Ear, and affects the Nerves in such a Manner so as to cause in us this Sensation.

TYRO. Now is it proved, that Air is the principal Cause of Sounds?

PHILO. Several Ways, but by none more than by the Experiment of the Air-Pump; for a small Bell may be heard a great Distance before the Air is exhausted, but when it is put into the Receiver, and the Air exhausted, you can then scarce hear it.

TYRO. I think if I remember you told me that *Sound* flies about 1100 Feet in a Second of Time, that is, 1 Million 3 Hundred and 20 Thousand Yards, or 7500 Miles in an Hour, which is about 8 Hundred Thousand Times less in Velocity than *Light*.

PHILO. I did so, and why do you repeat this again?

TYRO. I cannot help it; when I think of the Velocity of *Light* being so incredibly swift: I ask pardon; but pray how far are Sounds in general to be heard?

PHILO. It has been asserted, that *Sounds* continued or repeated have been heard at an incredible Distance. Thus Mr. *Clare* affirms, that he heard the Watch-Word, (*viz. All is well*) call'd by the Centinel from *Old to New Gibraltar*, which is upwards of 10  $\frac{1}{2}$  Miles; and Dr. *Hearne* asserts, that in the Year 1685 Guns fired at *Stockholm* were heard 180 Miles; and in the *Dutch War* 1672, they were heard near 200 Miles.

TYRO. I could never have thought Sounds could have been heard so far: But pray is there not a Difference between Sound flying before the Wind, and against it?

PHILO. There is, but not so much as some Persons imagine.

TYRO. Does not Sound fly equal Spaces in equal Times?

PHILO. Yes it does, whether in Summer, or Winter, Day, or Night; but then the Sound is not always equally strong, nor so full upon our Ears, for no doubt but the Strength of Wind for and against, and also a thinner or denser Air will cause a Difference in this Respect; but yet not so much as is supposed in common.

TYRO. I'm obliged to you, *Philomathes*; but pray give me Leave to ask you how it happens, that some Sounds are so agreeable and harmonious, while others are so dissonant and disagreeable?

PHILO. Your Question, *Tyro*, is very difficult to answer, on Account of the Proximity which it naturally requires; and not only this, but even on the Account of the Words *agreeable* and *disagreeable*; for you are to know for a Certainty, that *that* Sound which is now disagreeable may the next Minute become very agreeable to you.

TYRO. How can this be?

PHILO. It is so indeed, according to what other Tone or Sound it is accompanied with.

TYRO. You speak of *Sounds* relating to *Music*, I perceive.

PHILO. I do so.

TYRO. I wish you would give me some Account of the Nature and Passages of Musical Sounds.

PHILO. That I shall do under the Word *Musick*.

TYRO. Pray then before you leave this Head, tell me the Cause of *Echoes*, or why *Sounds* sometimes answer back or repeat the same Word?

PHILO. An *Echo* is caused by the vibrating Air being abrupted in its Passage. For, as the Air rolls or passes along like a Wave, it often meets with various Objects, and by striking against them, is reflected back to us, and causes new Vibrations, which (if the Object lies in a proper Situation) return to us and repeat the same Tone, Sound, or Word, as was first given, not only once, but several Times.

TYRO. This is very natural indeed, and easy to be conceived.

PHILO. I told you that sometimes Words are repeated several Times, but I have myself been in Places that would repeat 8, 10, or 12 Times over your Name, if I had called you once very loud.

TYRO. That's very extraordinary.

PHILO. Not at all; for it is affirmed, that in *Woodstock Park* near *Oxford*, there is an *Echo*, which will *echo* or repeat 16 or 17 distinct Syllables any Time of the Day, and from 11 at Night to 3 in the Morning it will repeat 20 Syllables, or a Monosyllable 20 Times over.

TYRO. But pray what is the Reason that it repeats more by Night than by Day?

PHILO. Because the Air being more dense the Vibrations are slower, and of Consequence a Repetition of more Syllables to be heard. See Dr. Plot's History of *Oxfordshire*, and Dr. Harris under the Word *Echo*.

## S E C T. VII.

*Of Wind, Rain, Hail, Frost, Snow and Ice.*

### 1. Of the WIND.

TYRO. What is *Wind*?

PHILO. A great Motion, Stream, or Torrent of Air.

TYRO. From what does this arise?

PHILO. From many Causes, but 'tis chiefly believed to arise from the swift and rapid Rotundity of the diurnal Motion of the Earth round its Axis, which leaves the Fluid and refined Particles of Air behind; and then they usher or break forth at certain Times into a violent Agitation, &c. But be this as it will, it is certain that the Air being turned out of its proper Order or Equilibrium; some Part thereof is put into greater Agitation than others, so as to produce a Stream of Air, a Storm or high Wind.

TYRO. But pray is not the Wind more regular in some Parts of the Globe than others?

PHILO. Yes.

TYRO.

TYRO. Are there not different Sorts of Winds pray ?

PHILO. Yes ; there are *common* or accidental Winds, 2 *general* Trade Winds, and 3 *periodical* Winds, called or named *Monsoons* by Lord Bacon.

TYRO. What do you mean by trading Winds ?

PHILO. They are such as blow from one Quarter ; thus in the *Atlantic* Ocean, they blow from the North-East, or about North-East to 30 Degrees Latitude on the North-Side of the Equator ; and in the *Ethiopic* and *Indian* Oceans, and great *South-Sea*, they blow from South-East about the South-East for about 30 Degrees Latitude on the South-Side of the Equator.

TYRO. What is the Property of the *Monsoons*, or shifting periodical Trade Winds ?

PHILO. They are such which blow, some 3 Months one Way, and three the other ; but the most regular or noted *Monsoons* are those which blow 6 Months one Way and 6 the other.

TYRO. Pray where is this, and what Time of the Year is it ?

PHILO. The *Monsoons* blow from the S. W. to the N. E. from *April* till the Beginning of *October*, in or about 50 Degrees East Longitude at the Equator, upon the Eastern Coast of *Africa*, passing from the *Eastern Ocean* cross the *Arabian Sea*, and then from *September* till *March*, they return and blow S. W. But below the Bay of *Bengal*, as also about 10 Degrees on the South-Side of the *India* Ocean, they blow 3 Months one Way and 3 the other.

TYRO. This is very strange ; but I suppose there is no immediate accounting for it.

PHILO. There are several Reasons to be given, why it may be so ; such as when the Sun passes the Equator Northward, he no doubt begins to refresh and warm those Countries, and the Air being less rarified by the Heat of its Beams becomes more ponderous, and possibly may cause or carry with them such a Motion of the Winds ; and then, in the Return to the South the other half Year, cause the *Monsoons* also to return with them. There are several other supposed Reasons ; but as they are not capable of so clear a Demonstration as many other Things, must be left to future Time for further Discoveries.

TYRO. What Degree of Velocity has Wind in general ?

PHILO. Dr. *Derham* and many others have plainly proved, that a gentle Breeze or a very small Wind does not move above 1 Mile an Hour ; a brisk Wind flies from 15 to 30 ; in a Storm from 30 to 50, and in a very great Storm from 50 to 60 Miles an Hour. — See Dr. *Derham*, Dr. *Harris*, *Rowning* and *Martin* ; but particularly Lord Bacon's History of the Wind, and the *Philos. Trans.* N°. 183.

## 2. Of Rain, Hail, Frost, Snow, &c.

TYRO. What is Rain ?

PHILO. Water descending from the Clouds, and being broken  
by



by the Resistance of the Air, falls upon the Earth in small or great Drops, according to the Quantity contained in the Clouds, and is more or less in the Velocity of its Descent, according to the Weight thereof, or being driven by the Wind, &c.

TYRO. Is not *Dew* like *Rain*, or has it not the Properties?

PHILO. It has; but in this they differ, that whenever the Water in the Clouds is heavier than the Air, it rains; but *Dew* being a moist, insensible Mist raised by the Heat of the Earth after Sun-set, ascends like a Fog; but meeting with a colder Air falls in small Drops on the Ground, and is so very fine in its Particles as to rest even on the very Tops of the small and tender Grass.

TYRO. What is *Hail*?

PHILO. *Rain* congealed more or less, according to the Height of the Clouds and the Coldness of the Region. Some Authors differ in their Opinions concerning it; the one asserts it is frozen in the Clouds before it descends; and others say, it is congealed in its Passage.

TYRO. What is *Frost*?

PHILO. That State or Condition of the Air which becomes so exceeding cold so as to freeze Water, or by which the Motion and Fluidity of Liquors are suspended, and become thick and frozen. Some say it arises from Salt saline Particles of Air which are so sharp pointed as to fix or insinuate themselves into the Pores of Water, and make hard the superficial Parts, and when increased becomes more and more a thick Ice. But, strictly speaking, 'tis the moist Surface of the Earth being encrusted, which we call *Frost*, and the *crystalized* Surfaces of the Water is called *Ice*.

## S E C T. VIII.

### *Of Meteors, Thunder, Lightning, Thunder-Bolt, &c.*

#### I. *Of METEORS and VAPOURS.*

TYRO. What do you call *Meteors*, and what are the Causes of the different Sorts?

PHILO. *Meteors* are mixt, changeable, moveable, and imperfect Bodies, formed by Damps, Heats, and spirituous Exhalations out of the common Elements, some of which are very high in the Air, and other here and there upon, or very near the Surface of the Earth: There are several Sorts, 1<sup>st</sup>. *Fiery Meteors*, composed of Fat, Salt, and sulphureous Exhalations, which are kindled in the Region of the Air, by violent clashing together in nitrous Air. 2. *Airy Meteors*, these are such as are produced from the Wind only, which often causes very odd Appearances in the Clouds, in Shape and Order. 3<sup>dly</sup>. *Watery Meteors*, these are such as proceed from *Vapours*, then these *Vapours* turn

often

often to *Mists*, these to *Clouds*, and *Clouds* to *Rain*, as was said before.

TYRO. Pray, Sir, what do you call *Vapours*?

PHILO. Small Particles of any Fluids separated or dissipated by Heat, which naturally ascend into the Air, or by Exhalation is drawn off from the Surface, or otherwise is forced up by Heat under the fluid Body, so as to cause a *Steam*, which in some Cases may be called a Vapour, because the Liquor is evaporated or drawn off.

TYRO. I understand you; and I have often admired the Number of Particles that fly off in boiling Liquors, which decrease the whole so insensibly by Degrees, that few Persons pay any regard to the Cause, and yet are often surprized at the Effect.

PHILO. You say right, *Tyro*; for several Liquors will waste  $\frac{1}{4}$  of the whole in one Hour; some more and some less, according to the Thinness or Thickness of the Fluidity.

TYRO. Then I perceive the Quantity of Steam or the Vapours are in Proportion to the liquid Surface of the Body.

PHILO. No doubt of it; for 'tis computed by Dr. *Halley* and several other eminent Mathematicians, that there is evaporated every Day out of the River of *Thames*, only in its whole Extent, about 20 Million Tons of Water every Day; but there is evaporated out of the *Mediterranean* upwards of 5 Thousand Million Tons every Day; what then must the Weight and Quantity be evaporated from the Surface of all the Oceans!

## 2. Of CLOUDS

TYRO. I am surprized at the Quantity of Water, &c. drawn off by Evaporation; pray where does it go to?

PHILO. I told you before into the Air, and by a Congeries or continual gathering together, mix with one another, and become thicker and more dense, so as to form *Clouds* of various Sizes, Thickness, Shape, Colour, Weight, &c. The lighter Sort flying more lofty in the Air, while others, more condense or weightier, float or fly nearer the Earth.

TYRO. I know the *Clouds* fly very low sometimes, and I have heard that in several Places in *England*, but more particularly in *Scotland*, some Persons have seen the *Clouds* pass much lower than the Hills they have been travelling over.

PHILO. No doubt of it, for it is evident, that the *Clouds* sometimes are not above  $\frac{1}{4}$ th of a Mile high, which is much less than many Mountains in *Great Britain*.

TYRO. What is the Shape and Colour of *Clouds* owing to?

PHILO. The Colours of *Clouds*, or the different Colours of any Cloud, is no doubt owing to the Rays of Light falling on them in different Positions; and as to their Shape, it is easy and natural to suppose, that this is owing to nothing but the different Force of Air or Wind, which drives them here and there; and therefore,

therefore, from their voluble or loose Texture, produce various Forms and Shapes.

TYRO. I believe this is true, because in very calm Days and Nights the Clouds seem as if they were fixed; at least their Motion is very insignificant to what it is at other Times.

PHILO. You judge very right, *Tyro*?

TYRO. Pray what other airy Meteors are there.

PHILO. The next Thing I shall give you a little Account of is

### 3. Of THUNDER and LIGHTNING.

TYRO. What is the Cause of *Thunder* and *Lightning*?

PHILO. *Thunder* and *Lightning*, the most dreadful and dangerous of all *Meteors*, are thus accounted for. The Air abounding (in hot Weather) with *Acids*, *Bitumen*, *Nitre*, *Sulphur*, &c. exhaled from various Bodies, and raised by the Sun's Heat into the Region thereof, and are there driven to and fro by the Wind, and being shut in between the Clouds and Atmosphere; their sharp, unctuous, spirituous, nitrous, and sulphureous Particles, being mixt together, and violently agitated and furiously acting upon, or striking against each other, force themselves, or are forced through the Clouds with an Explosion or Noise, called *Thunder*, accompanied with a Flame or Flash, which we call *Lightning*.

TYRO. Which of these do you suppose cause the *Thunder*, and which the *Lightning*?

PHILO. The bituminous and sulphureous Particles occasion the Flash, and the saline and nitrous Particles, no doubt, cause the Noise or Explosion, as plainly appears from the very Property of Gun-Powder.

TYRO. What is the Reason of our seeing the Flash of *Lightning* for some Time before we hear the *Thunder*?

PHILO. Certainly, *Tyro*, you forget what you have but just before read concerning the incredible Swiftneſs of *Light*, otherwise you could never have asked such a Question.

TYRO. I ask Pardon, indeed, and own it was for want of Thought; for I perceive the Reason is plain: for *Light* flying much swifter than Sound, it must of Course be seen much sooner than Sound can be heard from the same Distance.

PHILO. Now indeed you give me Pleasure; for is it not the same by the Discharge of any Gun or Cannon? every Body knows that the Flash is seen long before the Sound is heard.

TYRO. I'm quite clear in the whole thus far; and conclude from hence that 'tis possible, by observing the Time or Interval, between the Flash and the Sound of the Explosion, to tell the Distance of the Cloud from us?

PHILO.

PHILO. Yes, very easily, by comparing the Proportion of one with the other, as before directed.

TYRO. But pray give me some Account of the Nature of an Exploſion, or wherein, or in what Reſpect you think it dangerous or not dangerous.

PHILO. There is no Certainty, *Tyro*, in this; for if there was, then of Courſe, thoſe that know more of theſe Things than others do, would always take Care to avoid the Danger that they foreſaw. Plain it is then, that the Danger lies, more or leſs, in the Nearneſs or Diſtance of ſuch Exploſion.

TYRO. I am quite clear in the Truth of this. But pray, Sir, what do you ſay concerning the *Thunderbolt*?

PHILO. I ſay, *Tyro*, there is no ſuch Thing as it is commonly reported to be, ſuch as a large Bolt, Shell or Stone; but it is the more intenſe and moſt rapid Flame, which flies from the Clouds with incredible Swiftneſs immediately upon the breaking of the Cloud, and breaks down, drives before it, cuts off and deſtroys every Thing it meets with, even Towers, Trees, and even Mountains or Parts of Mountains, driving up the Stones and Earth for a conſiderable Diſtance, and in vaſt Quantities.

TYRO. What other Properties has this ſubtile and intenſe *Lightning*?

PHILO. It is affirmed by ſeveral credible and eminent Writers, that it will ſometimes break the Bones and not hurt the Clothes, break a Sword in the Scabbard and not hurt the Scabbard, &c. &c. The Reaſon ſome Philoſophers give (but it is mere Suppoſition) is, that the Particles of Light in different Flaſhes are different in the Reſpect of their Figure and Quality, but I ſhould think it rather proceeds from the Intenſity of them, and their incredible Velocity; for you remember the greater the Velocity or Celerity, the greater the Stroke or Force.

#### 4. Of other METEORS.

TYRO. I am obliged to you, *Philomathes*, but pray what other *Phænomena* of *Meteors* can you tell me of?

PHILO. There are many other *Meteors*, ſuch as, 1. The *Chafma*, or a Shining from or between the Breaks of different Clouds, when they juſt ſplit or part. 2. The *Lampas*, or Lamp burning in one Part only. 3. *Bolis* or *Dart*, when the Fire or Light is very long, and flies like a Dart. 4. *Draco Volans*, or flying Dragon. 5. *Capra Saltans*, or the ſkipping Goat. 6. *Stellæ Cadentes*, or Falling Stars, which is when the more firm or ſubtile Parts are burnt away. There are many other Sorts of fiery, airy, and watry *Meteors*; but none of them are ſo much noted as the *Ignis Fatuus*, both for its Shape, different Appearance, and other Odities.

TYRO. Pray what is the Cauſe of them, and where are they moſt frequently ſeen.

PHILO.



PHILO. The *Ignis Fatuus* (vulgarly called by some *Jack* with a *Lanthorn*, and by others *Will* with a *Wisp*) is caused by some fat or unctuous Vapours arising, which are immediately kindled, and by the Motion of the Air are wafted about here and there, on or near the Surface of the Earth, and often look like a Light in a Lanthorn. The most common Places where these are seen are in Church-Yards that lie flat and low, and also in boggy moist Ground and Marshes, and sometimes they appear in the more upland Places; but then it is to be observed, it is such that border upon, or are near such boggy Grounds, and being wafted or driven thither, they soon go out to what those do that continue in the more fat or unctuous Soil.

TYRO. You will excuse me, I hope, *Philomathes*; but pray give me some further Account of this odd *Phenomena*?

PHILO. I think, *Tyro*, you are vastly curious of asking odd Questions; I really suspect that you are afraid of Mr. *Jack* a *Lanthorn*.—Come, be free, and tell me if you know or have heard any Thing in particular about it.

TYRO. Dear Sir! I could tell you a hundred Stories that my Father, my Uncle, and several Neighbours have told concerning *this*, *that*, and the other Person, having been led out of the Way by these Lights; others have been terribly frightened, as not to recover it for a long Time after.

PHILO. You make me laugh to see how earnest you tell this Tale; and yet I am a little vexed to think you so silly as to think that there is any Danger in poor *Jack*.—See, *Tyro*, what the Prejudice of Education is: This plainly shews us the great Weakness and Folly of those Parents and Nurses, who tell ridiculous bugbear Stories to Children, of Apparitions, Noises, *Jack* a *Lanthorns*, &c. which possess their little Minds with such early Fear and Dread, that oftentimes they never get clear of.

TYRO. What I tell you I know to be true, and perhaps, *Philomathes*, you may not have had the Opportunity of seeing these Things, though you have read of them.

PHILO. Here you are mistaken again, *Tyro*; for I have seen sometimes ten, at other Times upwards of thirty together in one Ground, running here and there with great Swiftneſs, and sometimes mixt together as if they were dancing, then all at once several of them have disappeared (which I suppose was occasioned by their striking against one another, or against some Object) and thus by their strange Appearance and different Positions, they become a Terror to many People, but particularly young Folks, whose Ears and Minds have been too much filled with idle Tales of the Danger that attends these Meteors.

TYRO. But pray, Sir, did you never know or hear yourself that any Body was led out of their Way by the *Jack* a *Lanthorn*?

PHILO.

PHILO. Yes many; so that they have not found their Way Home by the Hours together, and gone Miles and Miles out of their Way; but then, as I observed before, I cannot allow that *Jack* leads them out of the Way, so much as the previous Fear of the Persons themselves; for when the *Will with the Wisp* happens to overtake or approach near them, they are struck with a Surprize at so shining a Light, and so dismal an Hobgoblin, that they immediately in a Fright turn, or run out of the direct Path-Way down any Turning or into any other Field, which leads them quite contrary to their Home. But you may depend upon it, *Tyro*, that Resolution and a good Presence of Mind would prevent these Inconveniencies and Disasters.

TYRO. I am clear in your Opinion indeed; but what would you have poor innocent Children do, who have been and still are possessed with such Notions?

PHILO. I heartily pity them, and blame those that insinuate such Trash into their early Minds, instead of Things of more Moment; and those who have been so unhappily brought up, and have had such Fear and Dread instilled into their Minds: You, and all other Persons therefore, that know there is no Occasion for such Fear, should try to convince them of their Error, and dissuade them from giving Heed to all foolish Fancies, and idle, ignorant, and inconsistent Stories of every Sort.

TYRO. What you say is very true, *Philomathes*, and I shall do my Endeavour to improve my Acquaintance at all Opportunities.

PHILO. This is the greatest Mark of a noble and generous Spirit, *Tyro*, and not only answers the very End of my instructing you, but undoubtedly answers the chief End of that little Knowledge which the great Benefactor has so freely given us; and in nothing we can more imitate him than by freely communicating every useful Thing to others.

TYRO. Have you any other Meteors that you can give me an Account of?

PHILO. Yes, there are many others, such as the *Rainbow*, and *Aurora Borealis*, or Lights in the North, but I cannot well give you an Account of these at present.

TYRO. Pray, *Philomathes*, oblige me so far, though it be ever so short.

PHILO. Then I assure you short it must be.

#### S E C T. IX.

*Of the Rainbow, Parbeliums, and Aurora Borealis, or Northern Lights.*

TYRO. What is the *Rainbow*?

PHILO. The *Rainbow* is a Meteor in the Sky, appearing in the Time of Rain, or just after it, in the Form of a Bow.

C c

TYRO.

TYRO. What is the Occasion or Cause of this Appearance?

PHILO. It is occasioned or produced by the falling Drops or Particles of Rain, by the Reflection and Refraction of the Rays of Light falling upon them.

TYRO. What is the Reason of the various Colours in the *Bow*?

PHILO. The very same that I told you before concerning *Colours*; that the least refrangible Rays produce or paint Red, and the most refrangible ones naturally produce Blue and Violet.

TYRO. I forgot myself indeed, *Philomathes*: But pray let me ask you why some *Bows* appear so very large to what others do?

PHILO. This is owing wholly to the Height of the Sun; for when the Sun is in the Meridian or highest Altitude, the *Bow* will be least to our Sight, being only a Segment of a Circle; but if the Sun be in the Horizon or just setting, then the *Bow* is as large as it can be, being very nearly a Semi-Circle.

TYRO. This is very natural to conceive; but pray what Part of the Hemisphere does the *Bow* generally appear in?

PHILO. Always opposite to the Sun; I say always opposite, which shews an invariable Rule where to find it, and as true a Fact that it is caused by the Rays of the Sun, shining upon the falling Drops of Rain.

TYRO. But I have seen two *Bows* sometimes, what is the Reason of that?

PHILO. The Reflection from the real *Bow* itself, which when the Sun shines very bright, and the opposite Part of the Heavens is dark and cloudy, there are always seen two *Bows*, and sometimes three, two of which are vulgarly called *Weather-beads*.

TYRO. I'm obliged to you, Sir.

## 2. Of PARHELIIUMS, HALO'S, &c.

TYRO. What are *Parheliums*?

PHILO. They are what are commonly called mock Suns, and are caused by Reflection.

TYRO. Are they tinged then with different Colours as the Rainbow is?

PHILO. Sometimes they are, and sometimes not; but I imagine this is more or less owing to the Strength of the Rays of Light, and Position of the Spectators.

TYRO. I think I have heard there has been seen two or three mock Suns at once.

PHILO. I make no doubt of it, there has been seen two several Times in *England* and *Scotland*; but there was seen in *Rome*, *March* 1629, no less than four, one of which was very much tinged with various Colours like the *Rainbow*, and the others more faintly so.

TYRO. What are *Halo's*?

PHILO.

PHILO. They are luminous *Meteors*, in the Form of a Ring or Circle, appearing round the Sun and Moon, and sometimes the Stars.

TYRO. What is supposed to be the Cause of *Halo's*?

PHILO. As the *Rainbow* is caused by the Reflection of Light on the Drops of falling Rain, so are *Halo's* caused by the Reflection of Light on small Hailstones; for whereas the first are seen only in rainy Weather, so these *Halo's* appear only in frosty Weather, in rimy, thick, and frosty Nights or Days, round the Sun and Moon, having them for their common Center.

### 3. Of the AURORA BOREALIS, or Northern Lights.

TYRO. I shall be glad to hear something about Lights in the Air, for I have been terribly afraid of them some Years ago.

PHILO. I make no doubt of it, for they are sometimes very striking to the Senses, and carry something dreadful with them when they fly with such Rapidity, and seem to clash furiously together in the Zenith.

TYRO. Very true, *Philomathes*, and especially when they look very angry, being tinged with Red, or bloody-coloured, as I have often seen them.

PHILO. What you say is very true; but however, there is not the least Occasion to be afraid of them, as there is not the least Danger arising from them, as there often is from Lightning and Explosion from Clouds vattly lower.

TYRO. But what do you apprehend is the Cause, or what do the most eminent Authors say upon this Subject?

PHILO. There have been various Reasons assigned by different Mathematicians and Philosophers, but there is no Room to give you these different Opinions; but this is plain, no doubt, that there are certain Steams, Exhalations or Vapours, that rise from Mines, Vulcano's, &c. which are sulphureous and inflammable, and being so very fine and thin, float in the Air, and necessarily and naturally, according to their Quantity, Force, or Celerity, shoot upwards towards the Zenith; and though these Steams are very wide below, yet they will in their Ascent appear pyramidical, or to terminate in a Point at their highest or vertical Extents; but sometimes they shoot even beyond the Zenith itself, but then expand, vanish, or are lost to the Sight; one would naturally think they must proceed from something inflammable, for they have the very Action of Light and Lightning, except it be that these ascend, being light and very fine, but Lightning descends, by Force and Explosion.

TYRO. But I have heard and read also, that this strange Phenomenon is never seen near the Equator.

PHILO. Very true, and it was once a great Rarity in *England*, but now common, though there have been no remarkable ones (in general Extent) except those in 1574, 1716, and 1727; but



those in 1716 extended from *Ireland* to the Confines of *Russia*, *Poland*, &c. Thus much for this extraordinary Meteor; only it is to be observed, that after those fiery Steams have spent themselves for want of fresh Supply of Matter, there is left in general a steady, bright Light in the North. If you would know the Particulars of the *Aurora Borealis*, see *Rowning's Philos.* Vol. V. Part 2, p. 147, &c.

## S E C T. X.

*Of Tides, or the Flux and Reflux of the Sea.*

TYRO. Of all Things in the Laws of Nature, I think nothing more wonderful, and to be admired, than the Flux and Reflux of Waters.

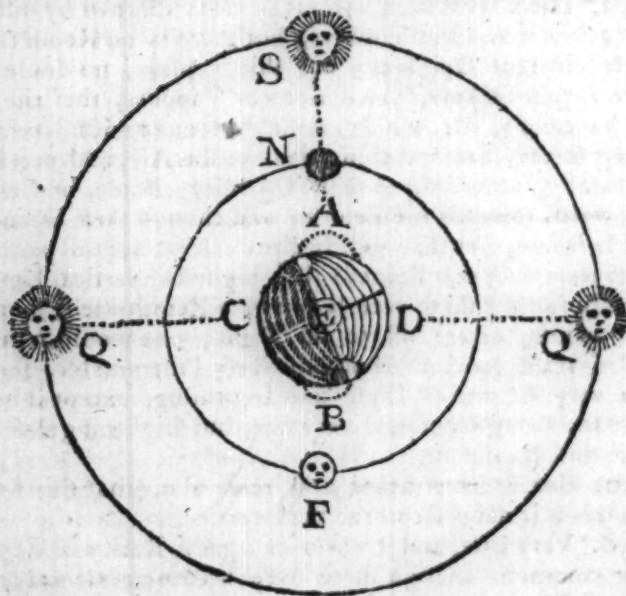
PHILO. It is very true; and though the natural Cause is known, yet there is something astonishing, when we consider such an immense Quantity of Water to roll backward and forward in such constant and periodical Order.

TYRO. You say the Cause is known; pray be so kind then as to tell me the Reason of the Ebbing and Flowing of the Water.

PHILO. Tides are undoubtedly caused by the attractive Power of the Sun and Moon upon the Waters of the Ocean; but more particularly by the attractive Force of the Moon.

TYRO. I wish you would demonstrate a little more to me by some Scheme or Figure.

PHILO. I will. Let E be the Earth, ABCD the Surface of the Water round the Earth: Let also N ☉, F ☾ represent the



Orb of the Moon round the Earth, N ☉ New Moon, F ☾ Full Moon, S Q Q the Sun in different Positions.

Now observe, 1. When the Sun and Moon are in Conjunction, viz. S N, these two Powers or Forces will attract or draw the Water upon the Surface of the Earth above, or beyond its common Course or Order, and cause it to rise up as high as A, which will be the highest Tide of all, commonly called a *Spring Tide*. 2. When the Moon is at the Full at F, then the Earth will be between the Sun and Moon, (that is, the Moon is in Opposition to the Sun) and there will be another *Spring Tide* rising or swelling to B, but not so high, you see, from the Surface as at A. Lastly, When the Sun is in his Quadratures Q or Q (viz. a Quadrant or one Quarter of a Circle from the Moon) then the attractive Power of the Sun takes off Part of the attractive Force of the Moon, and therefore at C and D there will be the least neap Tide of all.

TYRO. I am highly obliged to you, *Philomathes*, for it appears quite simple and natural to me; but yet I do not immediately know what you mean by the least neap Tide.

PHILO. The Reason why I call it the least neap is, because all Tides which happen between A C or A D; or between B C, or B D, are called neap Tides; those at A and B being only Spring Tides.

TYRO. I understand you, Sir; but pray do these Spring Tides happen always upon the Day or at the Time of New and Full Moon?

PHILO. No, it is generally the Second or third Tide after; nor are the Tides at highest when the Moon is in the Meridian, but two or three Hours after; and the Reason is plain, for the Motion communicated, or the active Force of Attraction, cannot fully act upon Waters in narrow Rivers; and in shoally Places; therefore do not come or flow regular and full in such Places just at that Time: So for the same Reason, the greatest Tides, as was said before, are not immediately at the Time of Conjunction or Opposition; for in the Ocean, or in any wide Sea or deep and extensive Waters, the Tides ebb and flow very regularly; for it is evident, that in the great *Pacific Ocean*, they exceed both in Largeness and Regularity those in the *Atlantic*, and in the *Atlantic* they exceed others in more narrow Seas, &c. for it is sooner high Water in some Places than others, and it is plain that the Water rises in some Rivers or Places, while it falls in others. For Instance, it is high Water on the Coast of *Portugal*, *Spain*, and the West of *Ireland*, much at the same Time (though it is not till two or three Hours after the Moon has passed the Meridian) by the Water flowing from the Western Ocean, and the *Mediterranean Sea*; from which there issues two large Currents of Water, one of which passes South of *England*, and the other

North of *Scotland*; and in these Tracts they naturally empty themselves into the large Channels, and these again into the smaller ones, and these last into the inland Rivers, &c. from which it plainly appears, that the Tides must be later in the Day in some Parts than in others, according to the Distance of such Rivers from the Sea, and in Proportion to their Narrowness, Windings, and Turnings, &c. 2dly, It also is evident, that while these Channels and Rivers are filling, by the Time they are full Tide the Moon has passed or advanced yet farther from the Meridian; but however, this being once known, the Certainty of calculating high Water at any Place becomes very natural and easy, as was shewn before. 3dly, It is therefore very natural to conceive, that the Water falls in some Places while it rises at others; and as it takes upwards of twelve Hours between Tide and Tide, 'tis easy to conceive that while the Waters are returning from the various Channels and different Rivers, there will be another new Tide or full Water at Sea, which meets with or repulses those smaller Currents, and forces them back again with Order and Constancy daily, only somewhat later, as was said before, because the Moon comes later to the Meridian.

TYRO. I am highly obliged to you, indeed, kind *Philomathes*, and I'm very well satisfied.

PHILO. I own I have given you but a short Account of these things.—If you would know every thing relating to them, you must consult Sir *Isaac Newton*, Dr. *Harris*, *Rowning* and *Martin*, as also the *Phil. Trans.*

## S E C T. XI.

*Of the constituent Parts, and different Strata or Layers of the Earth.*

TYRO. What does the Earth in general consist of?

PHILO. What it contains at a very great Depth or near the Center is, and must be, for ever unknown; but the great Dr. *Halley*, with many others, suppose, (and that very probable) that in or about its Center there are large Quantities of, or one large Mass of *magnetic Matter*, called the *Load Stone*. However, thus far is known, that there are vast Caverns, and Numbers of Recesses for Reception of Water, and no doubt but many Rivers, which feed the other small Channels, and by a Number of Conveyances, are carried from Place to Place in constant and due Order, as the Waters upon the Surface, some very deep and others more fleet, and so near the Surface as to break forth from thence continually, some in great, others in small Quantities of running Water, properly called Springs, &c.

TYRO. What does the more solid Parts chiefly consist of?

PHILO. There we find variety of different Sorts of Strata or Soil; for within a few Fathom deep in some Places, and but a few

few Yards deep in others, are found four or five various Sorts of Earth, such as *Clay*, *Gravil*, or *Sand*, *Loam*, *Marl*, or fat *Clay*, then black rich *Earth*, then red *Earth*, *Chalk*, *Coals*, &c. and perhaps the same over and over again, some Strata or Veins running perhaps but a Foot or a Yard deep, and for Miles in Length and Breadth; others 10, 20 or 30 Feet or Yards deep, and of less Extension; but as the constituent Parts are known very little more than 400 Feet deep, how then can we pretend to account for the Variety of the Strata, and of the Salt, nitrous, and sulphureous Matter and Substance, between the Surface and the Center, to the Depth of about 4000 Miles?

TYRO. Very true, *Philomathes*; but cannot you indulge me so far as to give me your Opinion what is the Cause of *Vulcano's* Explosions, and *Earthquakes*.

PHILO. I cannot deny you, *Tyro*, you ask with such a Desire of being improved.

## S E C T. XII.

### Of VULCANO's and EARTHQUAKES.

TYRO. What is a *Vulcano*?

PHILO. A burning Mountain, which continually emits, or as it were, vomits Fire, and sometimes breaks with a most hideous Noise, and sends forth or vomits liquid Fire, throws up vast Quantities of red hot Stones, and such Clouds of Smoke and Ashes, as even to darken the Sky and cover the Earth for Miles round.

TYRO. Then I perceive that *Vulcano's* are not only kindled by these Combustibles, but are actually fed by them. How terrible must it be!

PHILO. You would much more think so, did you see or live near any of them, but especially *Vesuvius* and Mount *Ætna*.

TYRO. Can you farther indulge me to let me know what Part they are in, and what has been said of them.

PHILO. I will. *Vesuvius* is a large burning Mountain, situate within six or seven Miles of *Naples* in *Italy*; I shall rather choose to speak of some Events and Vicissitudes that this *Vulcano* has undergone.

TYRO. I'm obliged to you, Sir; and pray where is *Ætna* situate?

PHILO. Mount *Ætna* is situate on the East Side of the Island of *Sicily*, and is a very high and burning Mountain, which made the Inhabitants call it *Monte Gibello*, the Mount of Mounts. Its Distance or Ascent from *Catanea* is about 30,000 Paces, or nearly 29 Miles. It is of a circular Form; the Circumference at the Bottom is about 100000 Paces, or very near 95 Miles, and its Height upwards of two Miles. It has had many Eruptions, viz. in 1169, 1329, 1408, 1444, 1447, 1536 and 37, 1554, 1669, 1693, and a very large one in 1753.

TYRO.



TYRO. Was there not great Damages done in these Eruptions?

PHILO. Yes, in all of them; but according to the best Historians, the most dismal of all was *that* in 1693, when there issued out from it a most dreadful Torrent of liquid Fire (which is more common to *Vesuvius*) and burning Matter which broke forth with a most hideous Noise, causing the Earth round it to shake most terribly, and the Devastation was so great before it ceased, that it entirely destroyed 15 or 16 different Towns, 18 Estates, and upwards of 90,000 Souls.

TYRO. This was such a terrible Thing to the Inhabitants, that I cannot help shuddering at the very Thoughts of so dismal a Scene.

PHILO. It is very true; but how easy is it for us to forget the Misfortunes of others; and though we live in an Island, perhaps the least remarkable or least known to be subject to Calamities of almost every Sort, yet you will find more Discontent and Murmuring, and particularly more Unthankfulness and Ingratitude to their merciful Creator and Preserver, than you will find in any Nation perhaps under the Sun, when the different Circumstances of Want, Pain, Sorrow, Grief and Sufferings, are rightly put together.

TYRO. It is too true, indeed, *Philomathes*. But however, let me ask you a Question: are not *Earthquakes* in general produced from the same Cause as *Vulcano's*, by *sulphureous Damps*, *nitrous Matter*, and *mineral Coruscations* or Fire, shut or pent up in the Earth?

PHILO. No doubt of it, and where they cannot have Vent, the Earth must more or less shake to such a certain Depth or Breadth as the Quantity or Force of such Combustibles consist of, or are more or less agitated. Thus it happens, you have Earthquakes on a Sudden with an Explosion, which sometimes providentially break in uninhabited Parts, and only shake or cause the Earth to tremble for a Moment or two in such Places as are inhabited. At other Times we have, as it were, a silent Earthquake, that is, a Shaking only; and this is attended with great Danger, for when these fiery and agitated Bodies cannot break through the Surface, they sometimes drive, or tear away vast Quantities of Ground near the Surface, by which Means, the Surface itself, with all the Inhabitants on that dismal and unhappy Spot, sink down suddenly to unknown Depths, and must be unavoidably buried in Ruin and Destruction. But I think we have dwelt long enough upon so solemn a Subject, and shall only add this, that though these Things are produced by natural Causes, or the Course of Nature, it gives no Room at all for the Deist, Atheist, or Prophane of any Sort, to sport with, and laugh at the Timidity of the more thinking Part of Mankind; since it is evident it is good to consider, that these natural Causes are first acted upon

upon by a supernatural Hand, and therefore to have proper Thoughts upon, and pay a reverend and due Regard to the Creator and Disposer of such Events, in and at such a Time in particular, cannot be bad; and if it is an Error 'tis an Error of the right Side (as the common Saying is) and therefore, *Tyro*, let us venture to set our Timidity at all such Times against their Temerity; let them laugh at us, and let us pity them.

TYRO. Sir, I thank you for your kind Instruction; and have you now any Thing else you can communicate to me worthy of Notice?

PHILO. Yes; as I have told you of the Earth's terrible Productions, I think I ought to present you with some more agreeable.

### S E C T. XIII.

*Of other constituent Parts and Productions of the Earth, viz. Fossils, Minerals, Ores, Stones, &c.*

TYRO. What are *Fossils*?

PHILO. The extensive meaning of the Word *Fossil* signifies every thing that is dug out of or is hid in the Earth, some of which are neither inflammable or soluble, others are so. Dr. *Hill* divides them into three Classes, *simple*, *compound*, and *metallic*, which comprehends all Minerals, Ores, &c. but we shall speak of those by themselves; therefore,

#### 1. Of FOSSILS.

TYRO. Is not Salt a Fossil?

PHILO. Yes, and there are many Sorts, but all may be reduced to three Sorts, two of which are volatile, *viz.* acrid, which are hot and bitter; the third is lixivious, or drawn from Ashes. Of these in Order. 1. *Allum*, or *Roch Allum*, is a Fossil Salt or white Mineral, separated first from the Earth by washing it with Water. Our *English Allum* is in very large Lumps, clear and transparent: In *Yorkshire* it is made of a Sort of blue Stone, with Urine and Sea Weed. There are other Countries which produce this Fossil, as *Leige*, *Constantinople*, and *Italy*, of which it is said this last is the best of all. 2. *Borax*, a Salt prepared from the Evaporation of Water, which runs from Copper Mines in *Bengal* and other Parts of the *Indies*: There is another green coloured Sort found in the Veins of Brass, Silver, or Gold Ores. 3. *Essential Salt* is natural Salt between, or partaking of the Quality both of a *fixed* and *volatile* Salt; it is extracted or obtained from various Plants, from *CrySTALLIZATION*, or Combination of the saline Particles. 4. *Fossil Salt* (call'd a *Sal Gem*) is dug out of several mountainous Places in *Poland*, *Catalonia*, *Russia*, *Persia*, &c. it is very transparent and very like our common Salt. 5. *Fixed Salt* is that which is not rarefied, nor will not easily pass off

off by Exhalation, but remains fixed after Calcination, or passing through the Fire. 6. *Volatile Salt* is contrary to the fixed Salt, for this rises in Heat, and flies off insensibly in Steam or Vapour; such are the Salts of some Vegetables and Animals. But to give you a clearer Idea, this is sufficient; those Salt Particles that fly off in Steam or Vapour are called *Volatile*, those that sink or are found at the Bottom, are called *Fixed*. 7. *Nitre* or *Salt-Petre* is a crystalline, pellucid, whitish and bitterish Salt, generated from Urine falling on Stones, and is sometimes found in or under old ruinous Buildings: When it is found in this crude State it has no Acidity; but having passed through the Operation by Fire, it becomes both acrid and acid; being impregnated with a Quantity of Spirits out of the Air, it becomes partly *volatile* and very strong; and being mixed with Sulphur in the Air and agitated, it is this Spirit that kindles, or bursts into a Flame in Lightning, Gunpowder, &c. *Sal Ammoniac*, a volatile Salt of two Sorts, *natural* and *artificial*. The *natural* is found in *Lybia*, and many Parts of *Africa*; the *artificial* is brought from *Egypt*, and is made of the Soot of Tufts, Dung of Animals sublimed; some also is brought from *Venice*. 9. *Tartar* or *Salt Tartar*, is a hard Substance, which adheres to the Side of Wine Casks; it is separated from the Liquor by Fermentation, and some is of a white or lightish Colour, and some reddish; the White, if good, is esteemed the best. 10. *Sulphur* is commonly taken for, or called by the Name of *Brimstone*; but there is a sensible Distinction; for though all *Brimstone* is *Sulphur*, or sulphureous, yet all *Sulphur* is not *Brimstone*; *Sulphur* however is well known to be an inflammable *Fossil*, it is both *native* and *facitious*, and is found in several Places, particularly in *Sicily*. The *Native* is of several Sorts, *viz.* grey, red, and green; the *Artificial* made from the *Native* or gross grey Sort is generally made up in Rolls, of a pale Yellow, and then it is called *Brimstone*; besides, the *Native* is like a Clay, very subject to crumble and take Fire; but the Yellow or *Brimstone* has very little Earth, but contains much Oil, and an acid vitriolic Salt. It melts with a small Heat, very soon takes Fire, burns away with a most excellent fine Blue, but a very strong and noxious Scent. There is another Sort of a fine Red, like *Cinnabar*, very transparent, but is so scarce and rare as to be known no where at present, but in or near the Gold Mines of *Peru*. The Green is the hardest of all, and is found only about Mount *Vesuvius*.

## OBSERVATIONS.

I am not willing, *Tyro*, to leave this Subject upon *Sulphur* without telling you something further that may be of Service: and, 1. *Sulphur*, among Chemists or in Chemistry, does not mean *Sulphur* itself or *Brimstone*, but all *oily*, *resinous*, and *fat* Substances,

Substances, whether of Animals or Vegetables. 2. *Sulphur* is of excellent use and service in many Respects. First, in the Composition of making Gunpowder. Secondly, In whitening Silks, Woollen Stuffs and Flowers by the Fume or Vapour. Thirdly, The Vapour of *Sulphur* and *Brimstone* will even act upon the Feathers of Animals; several Crows, Rooks, and other Black Birds have been made perfectly white by it, and have passed for Nature.

*N. B.* Though trifling, yet it may not be amiss to inform the Ignorant, that it is common in *London*, to wash old Walnuts and rub them over with *Sulphur* or *Brimstone* to imitate Nature and deceive the Buyer.

3. *Sulphur* is acknowledged by all the Writers upon, and by all the Practitioners in Physics, to be of excellent Use; so much indeed, that its Virtues are not really known to this Day, which it seems is on Account of its being so cheap and so common; but however, it is evident, that all the Faculty in Physics allow, that it is the very best and safest Remedy in all cutaneous Disorders, such as the Itch, or any scorbutic Disease arising in the Skin; because anointing the Parts with its Flower made into an Ointment, with Pork-Lard or fresh Butter, not only stops the Orifices of the Pustles, prevents the watry Liquor from tainting other Parts, but more particularly by choaking or destroying the *Animalcules* or living Creatures. 4. *Sulphur* is allowed to be a great Cleanser and Purifier of the Blood, but being apt to loosen the Bowels, should be used with Caution. 5. *Flores Sulphuris*, or Flowers of Sulphur, is used in Medicine as a Pectoral, for healing Distempers in the Stomach, Lungs, &c. 6. *Balsam of Sulphur*, is Flowers of Sulphur boiled with four Times the Quantity of Oil of Olives, till it comes to a Consistence, &c. It is counted a fine Pectoral, and a great inward Healer. Some is made with Sulphur and *Barbadoes Tar*. 7. *Precipitated Sulphur*, called *Milk of Sulphur*, is made of Flower of Sulphur and Quick-Lime.

☞ One Thing is very remarkable in the Nature of *Sulphur*, and that is, that whoever have used it in any cutaneous Disorder, it never fails to tarnish or change the Gold in their Pockets; the Silver will look as if it were rubbed with Gunpowder, and the Halfpence will turn to a mouldy Green.

## 2. Of other Sulphureous or Bituminous Bodies, &c.

1. *Amber* is a yellow, transparent, gummy or bituminous Substance, has a resinous Taste and Scent, somewhat like Turpentine. It is found in several small Currents, especially near the *Baltic Sea*; there are two other Sorts, black and white, some say they are natural, others artificial; be this as it will, it is plain that the yellow Amber being rubbed, has a powerful Force of  
Attraction



Attraction according to its Size, and will draw Straws, Feathers, Hairs, &c. at a considerable Distance, so as to stick and adhere to it. 2. *Ambergris* or *Ambergrease*, is a fragrant Drug of a greyish or Ash Colour, it is used as a Perfume or Cordial, and melts like Wax. It is a Kind of a Bitumen, and found in several Parts on the Coast of *Muscovy* and *India*. 3. *Arsenic*, though properly a Mineral, yet as it consists of a vast Quantity of *Sulphur*, it is ranked under this Head: It is a great Caustic, Corroder or Eater of the Flesh. There are three Sorts, *White*, *Yellow*, and *Red*: some say the *Yellow* is the natural Sort, which is found in Copper Mines, and is called *Orpiment*, from which the others are made, the *Red* is called *Sandaracha*. See *Cobalt*.

*N. B.* The corrosive Power of any of the Sorts of *Arsenic*, plainly discovers itself, for a very small Quantity mixt with almost every Metal, renders it friable, and destroys its Malleability. Even Silver and Gold are not able to stand its gnawing and fretting Quality; for which Reason the Refiners dread it in all their Operations: As for Iron and Copper, it soon destroys; and Tin in particular, it will even calcine and soon reduce to Ashes.

4. *Asphaltum*, or *Asphaltos*, is a dark Purple, brittle, inflammable, and bituminous Substance, found in the *Asphaltites*, or *Dead Sea*, *Egypt* and *Palestine*; from which it is called *Bitumen Judaicum*, or *Jewish Pitch*. Some very credible Authors, both antient and modern, affirm, that in or near all such Places, where *Asphaltum* abounds in Quantities, no Fish can live, nor can even the Birds fly over the Places, without great hazard of their Lives.

*N. B.* Nature, notwithstanding these noxious Qualities of *Asphaltos*, has provided for the Service of Man; for it is of great Use, being one of the principal Things used by Engravers to rub over the Face of their Plates in etching, &c. It is also used with *Aquæfortis*, in eating out the Figure or Form of any Beasts, Building, &c.

5. *Bitumen*, a fat, combustible, oily Matter, found in several Places, but particularly about *Babylon*, *Judea*, or in the Lake *Asphaltites* or *Dead Sea*. Some Sorts are hard like Pitch, others glutinous and spread like Mortar. Some Authors tell us, the *Babylonian Walls* and *Noah's Ark* were built with this Water.

6. *Naphta* is a sulphureous, clammy, inflammable, and bituminous Substance of different Colours, according to the Soil; there are great Quantities found in and about several Springs near the City of *Hett* in *Chaldea*, which the *Turks* call *Black Mastick*. There are other Sorts found in *Italy*, *France*, &c. the Property is such, that being once set on Fire, it is very difficult to extinguish it; Water making it burn with much more Fury. 7. *Petroleum*, or *Rock Oil*, called also *Oil of Peter*, is the most clear, lucid and transparent of all the inflammable and bituminous Substances. It distils or ouzes from the

The Clefs of several Rocks in *Prowence, Italy, Sicily, &c.* caused, as it is said, by the Force of some subterraneous Fire. It is so very inflammable, that when it stands still in any hollow Part, even the very Rays of the Sun will set it on fire, and a Candle carried near it never fails of setting it in Flames.

3. *Of the more solid Fossils, such as Minerals, &c.*

1. *Antimony*, a mineral Substance, of a metalline Nature, having almost all the Qualities of a real Metal, except that of Malleability; for which Reason it is by many called a *simple Fossil*: It is found in Gold, Silver, and Lead-Mines; but it is more common in *Transylvania, Germany, &c.* It is brittle, full of little shining Veins of different Colours. It fuses with some Difficulty in Fire, and dissolves in Water.

N. B. 1. *Antimony* is very valuable, being useful in *Specula*, or to finish concave burning Glasses, by giving them a fine Polish. 2. Being properly mixed with Bell-Metal, it adds to the Clearness of the Tone. 3. It is mixed with Tin to make it hard and white, and with Lead to make a proper Composition for the casting of Letters or Types for printing. 4. Mr. Boyle says its Use is so great in *Physics*, that with two or three other proper Things, it is almost sufficient to furnish an Apothecary's Shop, with *Cathartics, Emetics, Diuretics, or Diaphoretics*. There are many Names indeed, but it is sufficient to speak only of these that follow. 1. *Crocus*, or Saffron of *Antimony*, called by Farriers *Crocus Metallorum*. 2. Washed *Crocus*, called *Vinum Benedictum*, being a powerful Emetic. 3. Butter of *Antimony*. 4. *Regulus of Antimony*. 5. *Tincture of Antimony, &c. &c.*

2. *Bismuth* or *Marcasite*, is a hard, smooth, white, brittle, metallic Body, somewhat like Tin, and therefore called by some *Tin-Glass*; it contains an arsenical Salt, and is very dangerous to take inwardly. There are several chemical Preparations made from it, and the Flower is used to take Spots out of the Face.

3. *Chalk*, a Sort of mineral Substance, of different Colours, but more commonly white, abounding in barren and mountainous Lands; yet notwithstanding, it is a great Improvement to Lands, by being mixt with proper Earth and spread upon the Surface.

Black *Chalk*, or *Ochre*, is used by Painters on blue Paper, being a very fine Black.

Red *Chalk*, or *Ochre*, is an indurated clayey Sort of *Ochre*, used also in Painting; there is also a yellow Sort, commonly called *yellow Ochre*.

4. *Cinnabar*, a red, heavy, and very brilliant mineral Stone, found in Mines by itself, but most frequent in Quicksilver. Some say it is only Quicksilver petrified. *Vermillion* is made of it, by being reduced first to Powder, and then ground with a Mixture of Spirits of Wine and Urine.

5. *Coal*, or *Litbantbrax*, is a black, sulphureous, and bituminous Mineral, dug out of the Earth, and in many Places in *England* lies in Veins, mixed promiscuously with other Strata, and in other Places in very large Beds of great Extent and Depth. The best is of a deep shining Black, very brittle, and yet very friable, and being set on fire, burns to a Calx, with a Mixture of Ashes.

### III. Of METALS or ORES.

TYRO. What are *Metals*?

PHILO. All such simple Fossil Bodies, that are capable of Fusion, and become fluid by Fire, and when cold, coagulate, and harden into a solid Mass, and for the most Part are malleable. Such are *Copper*, *Gold*, *Iron*, *Lead*, and *Tin*; to which some add *Mercury* or *Quicksilver*, which is called a fluid or liquid *Metal*; others do not rank it with Metals, for its want of Malleability. 1. *Copper* is an *Ore*, found in different Mines Abroad and at Home. It is of such great Service in the making of various Instruments and Utenfils for the Service of Mankind, that it would be superfluous to say more of it: As to its Properties, they are, 1. Its Ponderosity is next to that of Silver. 2. Its Firmness or Fixity will endure the Fire longer than that of Tin or Lead, but not so long as Silver. 3. It must arrive at that State of Ignition, or be red hot before it fuses or melts. 4. It is dissoluble by *Acids*, *Alkaline*, or any nitrous Liquids or Fluids, in Salt-Water, and by the Dew, in open Air, &c. only with this Difference, *Acids* turn it *Green*, *Alkali* turns it *Red*, and Salt in general *Blue*. 5. When fused with *Lead* or *Antimony*, it flies off in Vapour. 6. It is extremely elastic, and most sonorous of all Bodies. 7. It is very malleable, and may be drawn out into small Wire to a great Length. 8. One Grain only, dissolved with 500,000 Grains of Water, will turn the whole to a pale Blue; so great is its Divisibility. 9. *Copper* is found in great Quantities in *Sweden* and *Germany*, in which Places there are even Mountains of it; but it is allowed, that *Hungary* has the best Mines and richest Ore.

*N. B.* *Brass* is made from *Copper*, by grinding calcined *Lapis Calaminaris* very small, and mixing it with fine Charcoal, and then incorporating it with Water into a Mass; then about seven Pounds of this Mixture mixed with about five Pounds of *Copper*, and put into a Wind-Furnace for eleven or twelve Hours, will be converted into *Brass*.

2. *Iron* is a very hard and brittle, yet a malleable and fusible Metal; its Texture consisting of Earth, Salt and Sulphur, makes it very liable to Rust. The Properties are as follows; 1. Its Fixity is such, that instead of fusing before Ignition, it requires not only a close Confinement in Fire before it will melt or run, but even that Fire must be well supplied with Wind, and the *Iron* be made (what the Smiths call) white, or welding hot, before

before it will fuse, run or separate; and by this Means many small Pieces are welded, beaten, and united together into one Mass; and if heated to a proper Degree, will adhere to each other closer and better than one Piece of itself of the same Length and Size. 3. *Iron*, though made more pliable, and ductile, and more easy malleable by Ignition or Heat, yet it may also be made much harder and more brittle, by heating it red hot, and then suddenly immersing it in Water, which will make some Sorts of it snap like Glass. 4. If it be first heated and then quenched in Sal-Armoniac or Quick-Lime, it will turn all the Particles of it quite white and exceeding brittle. 5. It is not only *rubiginous*, or vastly subject to contract Rust, either in Air, Dew, Fire, Salt or Water, but even becomes dissoluble in them. 6. It is very elastic and *sonorous*, but not so much as *Copper*, except it be when it is made into *Steel*, then it is more *sonorous* than *Copper* itself, but not so *sonorous* as *Brass*. 7. Of all Bodies none are so acted upon, or attracted by the Load-Stone to such a Degree as hard-bright Iron, or rather *Steel*; and so great is the Action, Power, Virtue, Force, and Efficacy of the Load-Stone over it, that it even communicates the same Virtue to it, especially if it be polished, so that it will become a *Magnetic*, and attract other Bodies very strongly. 8. Iron is found in Mines, not only in *England*, but in *Poland*, *France*, and *Germany*; but the greatest Ores are found in *Norway* and *Sweden*.

N. B. As *Brass* is made from *Copper*, so *Steel* is made from *Iron*; for it is only Iron purified in the Fire by Art with proper Ingredients, which causes it to be finer, whiter, and more hard and brittle. There are two Sorts, one called blister Steel, made of large Bars of Iron, which have Knobs or Blisters upon them; and this Sort is used for large Edge-Tools, such as Spades, Cleavers, Axes, &c.

3. *Lead*, called *Saturn*, is a very coarse, heavy, drossy, and impure Metal, consisting of Sulphur, some little Mercury, and a great Quantity of black bituminous Earth. The Properties are, 1. It is the next Metal in Weight to Gold, being heavier than Iron or Copper. 2. It is the least liable to Rust, and the least elastic and sonorous of all Metals, except Gold. 3. It is the softest and easiest malleable Body. 4. It requires the least Fire of all Metals to melt it, or put it in Fusion, (Tin excepted) and then, it appears (after the Dross is skimmed from the Surface) much of the Colour and Consistence of Quick-silver, rolls about in a liquified State like it, but does not separate in Parts so much, and if suffered to grow cool does not pass or run off in globular Bodies like the other. 5. Lead not only soon melts, being put in any Ladle or proper Vehicle over a Fire, but being continued over the Fire, soon becomes igni-



rious, and will in a short Time represent a Body of liquid Fire. 6. Its Use is so well known for Service, in the making of Cisterns to hold Water and other Liquids, and for making of Pipes for the Conveyance of Water, &c. from Place to Place, that it needs no further Description. 7. Lead is found in several Mines in *England, Germany, and Hungary*, sometimes pure, but much oftener in the mineral Ore.

4. *Silver*, or *Argentum*, is the purest of all Metals except Gold, and is found in some Places pure, and in others in Ore, mixed with *Copper, Cobalt, Antimony, Lead, Coal*, and other Minerals; some of which is blackish, some brown, others grey, which is owing to the different Strata or Bodies of Earth in which it is found. Its Properties are as follows. 1. It is the next to Lead in Weight, and its Fixity, Ductility, and Malleability is next to that of Gold. 2. It resisteth the Power of Lead in Fusion for a long Time, yet is refined by it; but when fused with Antimony, will, without great Care, turn to a *Scoria* or Dross. 3. *Silver* is not dissoluble by any Thing so soon as *Aqua fortis*. 4. Its Fusibility by Fire is easy, yet not so soon obtained as that of Lead, but melts immediately after Ignition. 5. It amalgamates with *Quick-silver* and volatilizes with Antimony. 6. It is more sonorous than Lead or Gold, but not so much as Iron or Copper, and may be drawn out into a very small Wire. 7. The *Chemists* suppose Silver to have some Affinity with the Moon, and therefore called *Luna*, and mark it thus  $\text{L}$ , and in Heraldry it is called *Argent*. 9. Its Beauty and Use are known to most Families, and its Neatness and Durableness are such, that nothing is so cheap in the End. 10. It is found in the Mines of *Peru, Chili, &c.* and it is of so high Esteem with all Nations, that it is not only used for Decoration, Shew, and Grandeur, but even as their current Coin abroad and at home. 11. The Standard for Silver Coins, called Sterling Silver in *England*, is a Mixture of 11 oz. 2 d. of pure Silver, with 11 dwt. of good Copper, and so in Proportion for any greater Mass or less Quantity.

5. *Tin* is a whitish coloured, sulphureous Metal, found blended with almost all Substances. Its Properties are, 1. It is the lightest of all other Metals, and the softest of all except Lead. 2. It loses more of its Weight in Fire than any of the Metals, which shews that its Fixity is the least of all. 3. It is melted by a less Degree of Heat even than Lead, for being mixed together in a Mass, and put in any proper Vehicle under a Fire, the Tin will run or separate first from the Lead. 4. The proper dissolvent of Tin is the same as Gold, viz. by *Aqua Regia*, and with Difficulty in this, but not by any other Means.

*Menstruum.* 5. *Tin*, though like Silver in its Colour, and by Art may be made to approach very near to it in Likeness, (Weight excepted) yet it is like a common Enemy to it, for if a Mass of Silver be mixt with but one tenth Part of Tin, it will become almost as brittle as Glass. 6. Another strange Property of *Tin* is, that though it is the least *sonorous* of all Metals except Lead, yet mixed with any of them, according to Art, greatly adds to the Clearness of the Sound. 7. It is also the least elastic of all except Lead, yet being mixed with others increases their Elasticity. 8. Tin-Ore is a heavy, spongy Sort of Stone, principally found in *Cornwall, Devonshire, &c.*

6. *Gold*, when refined from its Ore, has the following Properties. 1. It is the heaviest, most ductile, purest and most valuable of all Metals. 2. It requires very strong Fire to melt it, and its Fixity is so great that being melted many Times it loses but very little of its Weight. 3. Some say it is incapable of Rust, but it is known the Fumes of Sea-Salt will rust or canker it. 4. It amalgamates with Quicksilver the most readily of all Metals. 5. It will remain in the Fire for Days and Days melted, and being taken out will afterwards be found to lose nothing of its Weight. 6. It is of such surprizing Ductility, Dr. Halley tells us, that one Grain of it will gild ninety-eight square Yards; and Mr. Boyle says, one Grain and  $\frac{1}{4}$  may be beaten out into an Area upwards of fifty Inches square, and that one Ounce only may be drawn out into a Wire 274500 Yards long, viz. near 156 Miles in Length. It is dissoluble in no other Menstruum than *Aqua Regia*, with some small Quantity of Mercury. 8. It is found in Ore or in Dust in some Parts of *Guinea, Chili, Peru, &c.*

#### 7. Of Mercury or Quicksilver.

*Mercury* is not allowed by some to be a Mineral, but it is called in general a Semi-Mineral, and by all a Fluid. Its chief Properties are, 1. It is the heaviest of all Bodies except Gold. 2. It is the coldest to the Touch of all Bodies, and yet some Degree of Heat given to Waters, so as to make it just hot, will be sufficient to make the Mercury burn the Flesh severely. 3. Its Parts may be separate more to the naked Eye than any other Body, the Divisibility being apparent at any Stroke or sudden Pressure; a Piece, or rather one small Drop or Globule, may be separated into 100,000 visible Parts. 4. It passes off in Vapour almost as thin as the very finest Air, and yet it is pure Mercury still, and may be united. 5. It is quite volatile, and penetrates the Parts of other Bodies, making them brittle. 6. It dissolves in a strong acid Menstrua, and also indifferently in *Aqua Regia* and *Aqua fortis*. 7. Its Fluidity is so great, that it

never congeals nor freezes. 8. The Ores of Mercury are various, the general ones are called *Cinnabar*, found in many Mines in *Italy*. 9. There is also pure or *virgin* Mercury, which is found running in several Cavities or Veins in the Earth. 10. Its Use in Physic is well known, and its Power and Force are so great, that if given, or taken by unskilful Hands, it is present Death to some, and never fails to bring on a Ptyalism or Salivation, with trembling of the Nerves, and almost all Disorders.

#### IV. Of STONES.

There are so many Sorts of Fossils under this Denomination, that it would require a large Treatise to explain their different Texture and Uses. We hope therefore our young Tyro's will be satisfied, if we speak only of the coarser Sort in general, and the more fine and valuable in particular.

##### 1. Of the coarser or common Stones.

Of these there are five Sorts. 1. The common Stone of various Sorts and Sizes, found in Gravel or on the Surface of the Earth in every Place. 2. *Chalk Stones*. 3. *Pebbles* and other Stones used for Pavement. 4. *Portland Stone*. 5. *Flint Stones*, both used for Buildings; the last of which is so extreme fine that it is called the *English Agate*, and some Sort is so fine, after its being polished, that it is even ranked in the Order of Gems. No Stone will produce so much Fire as the black Flint when struck against hardened Iron or Steel, for which Reason it is not only used in Families but cut into a proper Size for Guns; its Use also in the making of Glass is so great and well known in general, that little more can be required to be said concerning it.

##### 2. Of the finer Sort of Stones, viz. *Alabaster*, *Porphry*, and *Marble*.

1. *Alabaster*, a fine Stone, somewhat like *Marble*, but much softer, and not so veiny or brittle. The best Sort is found in *Egypt* and also in *Cornwall*, being excellently variegated with Veins of a pale red, whitish or brown Colour, upon a very fine and clear pale yellow Ground. It is used in small Statues, Vases, and Columns; and cuts exceeding smooth. It is sometimes reduced to Powder, then mixt with Water, and used like Plaster of *Paris*.

2. *Porphry* is also a Sort of *Marble*, of various Colours; but that of the brownish red Colour is called the best. It is so exceeding hard, that few Tools will cut it, and also is very difficult to calcine. It is found in *Egypt* in immense Strata. Also

in *Arabia, Germany, England, &c.* but that found in the Island of *Minorca* is said to be superior to all the *Italian Marble*.

3. *Marble*, a very hard, fine and curious Stone, found in the Quarries of *Italy, England, &c.* and many other Places. It is much harder than *Alabaster*; but not so hard as *Porphyry*. There are fourteen Sorts, some of which are white, brown, red, green, black, blue, yellow, veined, and variegated beyond the Power of Man to describe; but the *Italian Marble*, called *Brocatello*, is counted the finest, being red, variegated with white and gold Veins. It bears an exceeding fine Polish, and its Use and Beauty in Buildings, and raising Monuments, are well known.

3. Of the smaller and more precious Stones, in alphabetical Order.

1. *Adamant*, (or *Diamond*) is not only the hardest, but the most precious of all Gems; there are several *Adamants* of various Colours, viz. darkish, green Crystal, &c. but the Crystal being the most pellucid, shining, and transparent, is counted the best. The real *Adamant* has an electric and attractive Quality, and in hardness far exceeds all other Bodies; for nothing will cut *Adamant* or *Diamond*; nay, even the best harden'd Steel will not cut common Glass, which *Adamant* cuts with ease and Pleasure.

As there are several *Gems* taken for *Diamonds* in Appearance, it is by this Property of cutting other Bodies that the *Adamant* or *Diamond* is truly known and distinguished. See the Word *Diamond*.

2. *Agat* or *Achate*, is a semi-pellucid Gem of various Colours, viz. white, (called the *Mocoa Stone*), red, green, and yellow; some of them when cut are full of Veins, which represent Animals, Trees, Rivers, &c. and though an opaque Stone, yet have a fine and beautiful Surface, and shines very much by a strong reflected Light.

3. *Amethyst*, a precious Stone or Gem, of a purple Colour in general, but yet is sometimes composed with, or tinged or mixed with a pale red, deep red, or violet; but when found colourless, or by being made so by passing thro' the Fire, it then becomes very pellucid, and equal in Value to the Ruby and Sapphire; and it must be a Person of no small Judgment, to distinguish it from a Diamond. They are found in several Parts of *Europe*, but those of the East and West *Indies* are the best, being the hardest and most pellucid. It was the last in the third Row of *Aaron's Breast-Plate*.

4. *Beryl*, is a pellucid Stone, of a pale green Colour, something of the Nature of a Crystal. It is found about the Gold Mines of *Peru*, also in the Earth at the Foot of Mount *Taurus*, and in the *Euphrates*, sometimes in a Pebble-like Form, at others



others in hexangular Columns, terminating in hexangular Pyramids. Its Hardness is very near the *Garnet*, and its Size from a small Pear to a Walnut. It was the first Stone of the fourth Row in *Aaron's Breast-Plate*, on which was engraved *Naphthali*.

5. *Beryl Crystal*, called by the Lapidaries the *brown Crystal*.

6. *Carbuncle*, a precious Stone of Scarlet or fiery Colour. It is in Hardness about the same Degree of the *Sapphire*, and found in general in angular Forms, about the Size of a Horse Bean. It bears the Fire without altering, and being held up against the Sun, looks like a burning Charcoal. It is found in the *East Indies*. It was the last Stone of the first Row in *Aaron's Breast-Plate*.

7. *Carnelian*, a Species of the *Sardonyx*, is a semi-pellucid Stone, of a reddish Colour, pretty hard, clear, and free from Spots, found in the *East Indies* and other Places. This Stone is mostly used for Seals.

8. *Chalcedony*, a semi-pellucid Gem, variegated with different Colours, which resemble so many white Clouds. The bluish *Chalcedony* is reckoned the most valuable, and is now ranked among the ordinary Sort of Agats, and is used for Seals, and often engraved with Coats of Arms, &c. It is used also to make Vases, smell Cups, Crucifixes, and Beads. All the Sorts readily strike Fire with Steel.

9. *Chrysolite*, is a precious Gold-coloured Stone, mixed with green, which gives it an exceeding fine Lustre. It was the first stone of the third Row in *Aaron's Breast-Plate*. It is called by the Jewellers a *Topaz*. It is found in *Silesia*, *Bobemia*, and *New-Spain*, in irregular pebble Forms, never columnar, and seldom larger than the Size of a Nutmeg.

10. *Chrysopeirasus*, a species of the *Prasius*, of a pale but pure green Colour, and is one of those mentioned in *Revelations*, Chap. xxi. ver. 20.

11. *Crystal*, a very fine pellucid and transparent Stone, resembling a Diamond, but being much softer, has not that Lustre. *Crystal* is found on the Top of high Mountains, in various Places and different Shapes; some being columnar, with double Pyramids, others pentangular and hexangular, &c.

12. *Diamond*, (see *Adamant*) the most precious, pellucid, and valuable of all Gems. They are found in the Isle *Borneo*, and in several other Places in the *East and West Indies*, in various Sizes and Shapes, but generally very small, the largest (which several Authors agree is not so large as a Walnut) is said to be in the Possession of the *Great Mogul*; it weighs about 280 Carats, and is worth about 780000 Pounds Sterling.

13. *Emerald*, (or *Smaragdus*) a precious transparent Stone, of a fine green Colour, and next in Hardness to the Ruby, and

for Beauty none exceeds it. This Stone is found both in the East and West Indies, in various Shapes and Sizes. It was the first Stone in the second Row in Aaron's Breast-Plate.

14. *Hyacinth*, or *Jacinth* (*Rev. Chap. xxi. ver. 20.*) is a precious Stone, of the Carbuncle Sort, of a fine red Colour (like to the Flower of the same Name) but has not that Lustre, nor appears so striking to the Eye as Gems in general. The Jewellers divide them into four Sorts, *viz.* 1. *Hyacinthula Belle*, a Sort of a Flame or faint red mixed with yellow. 2. *Amber Hyacinth*, mixed with a light yellow and red. 3. *Saffron Hyacinth*, is partly yellow and red, but not clear; and, 4. *A Rubacella*, which is a fine deep red, mixed with yellow. The first of these is found in the East and West Indies, the last only in the East Indies.

15. *Jasper* was formerly reckoned among the precious Stones, as appears from its being ranked with them in *Rev. Chap. xxi. ver. 19.* but the Moderns count it only as a semi-pellucid Stone at best, and very little better than the finest Marble, though it is harder, and will bear an excellent polish. It is a stone of various Colours, but the Green, called *Lapis Divinus*, is the most common; which is found in several Parts of the East Indies. There are others of various Shapes, and as for Size, they run from two Inches to a Foot diameter. It was the last Stone in the fourth Row of Aaron's Breast-Plate.

16. *Onyx*, a Sort of a semi-pellucid Gem, the Colour of the human Nails, having Zones of various Colours, but not red, and though competed with a Sort of Jasper, debased with Earth. The highest coloured Sort is found in the Red Sea, the more dark Sort in several Parts in and about Babylon. It was the second Stone in the fourth Row in Aaron's Breast-Plate.

17. *Prasus*, is a Sort of an Emerald, but not so hard, and of a coarser green.

18. *Ruby*, a very precious Gem, of a fine red Colour, mixed sometimes with a yellow or purple. When it is found pure it is of very little less Value than the Diamond, and very near as hard. It is also called *Sardis*, from a Place of that Name in *Lybia* in *Asia*, where the pale Sort is found. It is supposed to be the first Stone of the first Row in Aaron's Breast-Plate.

19. *Smaragdus*. See Emerald.

20. *Sapphire*, a precious pellucid Gem, of a fine blue. The deepest blue Sort is counted the best, and is in Value next to a Diamond. They are found in various Forms and Sizes in *Pegu*, and many other Places in the Indies, also the Isle of *Ceylon*, &c. It was the second Stone in the second Row in Aaron's Breast-Plate.

21. *Sardonyx*, a precious pellucid Stone, of a pale red Colour, a Sort of a Mixture of the Ruby and the Onyx. Some reckon

reckon four Sorts, viz. 1. The red *Sardonyx*, variegated with the *Onyx*. 2. The broad-zoned *Sardony*. 3. The horny *Onyx*, with white and yellow Zones; and, 4. The light bluish *Sardonyx*, with yellow or orange-coloured Zones. The *Carnelians* are comprehended in the first Sort.

22. *Topaz*, a precious pellucid Gem, of a curious green Colour, like the *Emerald*; but others say it is of a fine yellow, and for that was called *Chrysolite*. These Gems run so very small, that they are seldom found larger than a Pea. It is equal to the Ruby in Hardness, and in Value next the Diamond. They are found in the *East Indies*, also *Bohemia*, *Silesia*, &c. It was the second Stone of the first Row in *Aaron's Breast-Plate*.

Thus, *Tyro*, I have endeavoured to give you a short Account of every useful Thing. If your Curiosity should lead you farther after *Fossils*, &c. I refer you to *Dr. Hill*, and several others on that Subject.

*TYRO*. I am highly obliged to you, kind *Philomathes*; and now, if you please, should like to know a little of *Theology*.

*PHILO*. I am ready to answer you, *Tyro*.

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THE  
YOUNG MAN'S  
Book of Knowledge, &c.

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PART V.  
OF THEOLOGY.

SECT. I.

TYRO. WHAT is *Theology*?

PHILO. *Theology* signifies *Divinity*, and is that Science, whose Doctrine treats of, and instructs us in the Knowledge of God and the Practice of Religion.

TYRO. Into how many Parts is *Theology* divided?

PHILO. Into five, viz. *Natural*, *Supernatural*, *Moral*, *Positive*, and *Scholastic*.

TYRO. What do you mean by *natural Theology*?

PHILO. *Natural Theology* is that which treats of the Existence of God, and the Works of Creation, as far as is discovered by the *Light* of Nature.

TYRO. What is *supernatural Theology*?

PHILO. *Supernatural Theology* is the Will of God communicated or revealed to Mankind by Revelation, by which we not only know more of God than by natural Reason only, but are more particularly bound by Obligation to perform our Duty to him as a Lawgiver; he having revealed such things to us that never could have been discovered by all the natural Reason of Man, nor even by the Conception of Angels.—But I will  
not



not prevent you, *Tyro*, at present, as I shall give you a fuller Account of this by and by; therefore, pray go on in your Enquiry.

TYRO. What is *moral Theology*?

PHILO. *Moral Theology* is that which instructs us in that Part of the divine Law, which tends to the Well-being of Society in general, and the more particular Behaviour, Carriage, Duty or Deportment to each other in particular, in the different Callings, Variations and Circumstances of Life, either as Superior, Equal, or Inferior.— This, therefore, runs parallel with the Laws of revealed Religion, and comes under that Head.

TYRO. What is *Positive Theology*?

PHILO. *Positive Theology* is the Opinion of the Fathers of the Church concerning the Holy Scriptures.—Or, in other Words, it is that which obliges us to think of, and believe the Interpretation of the Sacred Writings, according to the Opinions, and agreeable to the Sentiments of the antient Fathers of the Church, be it right or wrong.

TYRO. What is *Scholastic Theology*?

PHILO. *Scholastic Theology* is that which derives its Arguments from certain Rules of Reasoning, and teaches us Religion from some established Opinions, Articles or Matters of Faith.

TYRO. I perceive then, that all of these may be comprehended under *natural* and *supernatural* Religion.

PHILO. They may so.

TYRO. But I shall be obliged to you, kind *Philomatbes*, to give me a fuller Account of *natural* and *supernatural* Religion, with Respect to the different Ends they tend to,

PHILO. I will.

## S E C T. II.

### *A farther Account of the Religion of Nature.*

TYRO. Is Man capable of knowing God by the Light of Nature or Reason only?

PHILO. Most certainly he is, as far as relates to the Works of Creation and Providence. For God having created Man with a Power or Faculty of reasoning, reflecting, and considering; Man must of necessity, as it were, acknowledge, that there is certainly some first Cause; and if he uses his Reason, and further contemplates the Works of Nature, he cannot help at last to own and confess the Existence of a God.

TYRO. But there are some Persons that either think not at all, or else speak against their own Conscience and the very Dictates of Nature, else whence comes the *Atheist*, who says there is no God?

PHILO.

PHILO. Though there are such Men, who have boldly denied the Existence of God, yet there never was, nor is there now so many of this Stamp as is commonly reported: And in my own Opinion, I cannot conceive there can be an Atheist any more than I can be persuaded that the Priests, Friars, &c. of the Church of *Rome* do themselves really believe the inconsistent Doctrine of *Transubstantiation*. For though it is very natural to suppose, that every Man, of course, believes that which he himself daily preaches up and propagates, yet we daily find it is not so; for it is often done out of a deceitful, wicked, and devilish Custom and Infatuation, to serve some worldly Ends, or sinister Views and Designs.

TYRO. I believe what you say is true: But pray, is the Light of Nature sufficient to convince us of the Existence of a supreme Being?

PHILO. Yes, in many Respects, would Man but follow its Dictates, and reflect: For, (1.) Nature itself. (2.) The Order of the heavenly Bodies. (3.) The Power, Nature, and Faculty of various Animals. (4.) Their Aptitude to Man. (5.) The vegetable Creation. (6.) Matter itself, &c. all loudly proclaim the Existence of an almighty, all-wise and all-powerful God.

TYRO. Very true indeed; and pray does not Nature also instruct us to honour, reverence, worship, and fear this our Creator, and do Justice one to another?

PHILO. Nature, no doubt, instructs us, that there is not only a divine Being who created us, but that we should also worship and adore him; but how, and in what Manner it is to be done, and how Men are to act in respect to God and each other, in what is now called moral Acts, Nature has not so well provided for, and Reason alone, before revealed Religion, always fell short of it; there being no Law previous to the Law giver, and 'tis absurd to suppose one Man's Rules or Laws should be binding to another, abstracted from the Laws of their Creator.

It is plain, therefore, that natural Laws built only upon natural Reason, are quite different from the positive Laws of the Creator himself; God having revealed his Will to Man, and given him Rules to walk by, to the End he might glorify God and enjoy him for ever. This, Nature itself has not Power to do.

not prevent you, *Tyro*, at present, as I shall give you a fuller Account of this by and by; therefore, pray go on in your Enquiry.

*TYRO.* What is *moral Theology*?

*PHILO.* *Moral Theology* is that which instructs us in that Part of the divine Law, which tends to the Well-being of Society in general, and the more particular Behaviour, Carriage, Duty or Deportment to each other in particular, in the different Callings, Variations and Circumstances of Life, either as Superior, Equal, or Inferior.—This, therefore, runs parallel with the Laws of revealed Religion, and comes under that Head.

*TYRO.* What is *Positive Theology*?

*PHILO.* *Positive Theology* is the Opinion of the Fathers of the Church concerning the Holy Scriptures.—Or, in other Words, it is that which obliges us to think of, and believe the Interpretation of the Sacred Writings, according to the Opinions, and agreeable to the Sentiments of the antient Fathers of the Church, be it right or wrong.

*TYRO.* What is *Scholastic Theology*?

*PHILO.* *Scholastic Theology* is that which derives its Arguments from certain Rules of Reasoning, and teaches us Religion from some established Opinions, Articles or Matters of Faith.

*TYRO.* I perceive then, that all of these may be comprehended under *natural* and *supernatural* Religion.

*PHILO.* They may so.

*TYRO.* But I shall be obliged to you, kind *Philomatbes*, to give me a fuller Account of *natural* and *supernatural* Religion, with Respect to the different Ends they tend to.

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## S E C T. III.

*Shewing that the supposed Laws of Nature and Reason cannot be binding, without some positive Law from a superior primary Being.*

TYRO. You have already shewn me, that by the Light of Nature only Man may be convinced there is a divine Being; and that if he exercises his Reason, he will naturally be led to think, believe, and confess, that this Being is the greatest Object of his Adoration.

PHILO. Very well, I have so — What then?

TYRO. Why, you puzzle me when you said the Laws of Nature are not binding to us, respecting moral Good and Evil.

PHILO. Don't mistake me, dear Tyro; when I speak of the Nature, or the Dictates of Nature only, I would be understood thus: That natural Reason itself is so far from regulating our Actions, that without there had been some Law or Rules promulgated by a Law giver, Men would have been continually striving for Mastery, and involved in perpetual Confusion; because Nature of itself, tells me, I have as great a Right to command or prescribe Laws for you, as you have for me; and when you speak of Nature only, there can be no Superiority, consequently then all Subordination ceases, all being upon a Level before some Law was given; and as for the Origin of moral Good and Evil, Dignity of human Nature, &c. they are not to be defined by the Light of Nature, being abstract Ideas built only upon Hypothesis, and the constant contradictory Opinions of Men, both antient and modern, as you will soon see hereafter.

TYRO. You are very smart upon me, *Philomathes*:—But pray give me Leave;—Does not the Light of Nature teach us the Origin of moral Good and Evil, and that Man being the Head of the Creation, should act according to the Dignity of his Nature?

PHILO. You ask the Question with such Earnestness, I cannot help smiling; because I perceive plainly that you have blended Part of supernatural with natural Religion; but I told you before that we are now speaking of all such Nations or Individuals, who never had, or have yet received any Laws or superior Rules or Commands to walk by.

TYRO. I shall be obliged to you to instruct me further on this Head; but I always thought, that Man's chief Happiness consisted in following the pure Dictates of Nature, and his own natural Reason—If I am wrong, pray convince me?

PHILO. I won't promise to do that; but I will endeavour to prove that the Dictates of Nature, abstracted (as I said before)

before) from positive Laws, never were capable of instructing us, much less of binding us to this or that particular Duty; nor can it be supposed, we should have known wherein our real Happiness consisted, had it not been for a superior Evidence.

TYRO. Can you prove what you assert?

PHILO. Very easily: For the Schoolmen themselves never knew what they meant concerning the Origin of moral Good and Evil, nor could they define it: Neither did they ever agree rightly concerning the *Summum Bonum* itself, though in the Schools of Greece (as Varro and others affirm) there were above two hundred Persons daily disputing upon, and as often disagreeing in their Judgments concerning this and many other Things.

TYRO. What did they use to say concerning Man?

PHILO. They tell us that Man is a noble Creature, that he has a penetrating Judgment, a capacious Understanding, and a tenacious Memory, &c. and therefore he should act according to the Dignity of his Nature, and purge his Soul from all Impurities; and then he will become a terrestrial God, &c. But what of all this, suppose I was minded to act contrary to what they call the Dignity of my Nature, what then?

TYRO. Why, then, certainly you would do wrong, and must give Account of, and be answerable for it.

PHILO. I thought you would say so—But this is absurd, and is of itself a self-evident Contradiction — because Nature and Reason have no binding Laws: If so then, Whose governing Authority have I contemned? or whose, or what Law have I broken? I cannot then be guilty of a Fault in disobeying a Command or breaking a Law, before I knew there was a Law giver; nor can I, by the Reason, be guilty of any moral Turpitude, without breaking some Law or Command, which I was previously enjoined to keep.

TYRO. I must own, Sir, your Argument has great Reason in it, and I begin to see more plainly the Truth of what you first asserted. I should be glad, however, if you could instruct me further on this Subject, that I may be yet more capable to support the Argument myself, and instruct others.

PHILO. There remains very little more to be said on this Head, except it be to point out to you the Difference between negative or natural Laws, and positive obligatory Laws. Therefore, from what has already been said, the following Axioms, or self-evident Truths, and Observations, may easily be deduced.

#### A X I O M I.

No Law laid down or prescribed by any one Man for another to act by, can possibly be binding, one having the same Right by the Laws of Nature as the other to prescribe Laws also.

## A X I O M II.

Natural, inherent, or intrinsic Good and Evil, Dignity of Nature, &c. abstracted from the Laws of real Obligation from some superior Law giver, are at best but Words without Meaning, and only Chimeras of Imagination, built upon nothing else but the sandy Foundation of idle Fancy and inconsistent Ideas.

## A X I O M III.

Since the Law of Man, abstracted from some divine Law, cannot be obligatory; it will naturally follow, that God as Creator has an indisputable Right of Proprietorship; and therefore, he not only created Man fit to be ruled and to rule; but has himself given Laws, and signified to us that Man must of Necessity be so ruled in Subordination to his Will. Hence follows,

## A X I O M IV.

The Foundation of moral Good and Evil arises only from the preceptive and prohibiting Will of God, made known to Man; God having given him Laws to walk by, which tend both to his own Glory and Man's greatest Happiness; and therefore no one Man has a Right to force another to assent to his particular Notions, it being not only contrary to the Laws of his Creator, but is also a Violation of the Laws of right Reason, and a bare-faced Insult offered to the Understanding.

TYRO. I return you heartily Thanks, dear *Philomathes*, and am now fully satisfied of the Truth of what you have asserted.

## S E C T. IV.

*A further Account of supernatural Theology, by which the Will of God was more particularly revealed to Man, and Man more particularly bound to believe and obey him.*

TYRO. What do you fully mean by *revealed Religion*?

PHILO. *Revealed Religion* is the Manifestation of the Will of God, made known to Man by Revelation, concerning his Son Jesus Christ, coming in the Flesh, taking our Nature upon him, dying for our Sins, and rising again for our Justification.

TYRO. How was this made known?

PHILO. Sometimes by *Vision* or *Inspiration*, and sometimes by speaking to Man, as it were, Face to Face, communicating to him not only Things which are present, but those which are past and to come, and that never could have entered into the Mind of Man

Man to conceive of, much less to tell the very Time of such future Events and Vicissitudes, which should happen or come to pass to his own Church, and to the different States and Nations, and this with an infallible Certainty; as witness, *Jacob, Moses, Isaiah*, and all the Prophets, whose Predictions did certainly come to pass, as are plainly set forth, not only by the Apostles, who were endowed with a peculiar Inspiration, but the Accomplishment of the Truth of such Prophecies were well known to the Jews themselves, and have been acknowledged by *Josephus* and many other Historians at that Time.

TYRO. These Things are so evident, that certainly no body can doubt of the Truth of them.

PHILO. One would think so, indeed, but yet, you are very much mistaken; for we have Numbers of *deistical* Persons among us, who lead their Lives and Conversation with due Regard to all the Rules of Morality; and yet are Captains over the Armies of such as deny Revelation and all revealed Religion; and not only laugh at all the sacred Writings of the Apostles and Prophets, but take a Delight to ridicule those who believe them, and with a seeming Surprise will tell you, That they thought you were a Man of better Sense, than to be led aside with such bugbear priest-craft Stories, that are so contradictory to Reason itself, &c.

TYRO. Why, you surprize me, *Philomathes*: Certainly there cannot be such a Set of Wretches mixt with the Professors of Christianity!

PHILO. Most certainly there is; and therefore all Christians of every Sect and Denomination, should be upon their Guard, and should take Care to furnish themselves with sufficient Knowledge to withstand so dangerous and insinuating an Enemy.

TYRO. Very true, Sir; but it is surprizing to me, that Persons who pretend to Morality should rail against the Scriptures; since no Writings ever penned, treat so much and so clearly of all the relative Duties of King and Subject, Parents and Children, Masters and Servants, as they do; besides enforcing the Obligation we are under (as you observed before) to a divine Law, in discharging such Duties, and the Expectations of future Rewards and Punishments resulting from the true Performance or Neglect of them.

PHILO. I am quite pleased, *Tyro*, that you have given such a full and satisfactory an Answer; and I heartily wish you may increase in the Knowledge of these Things, and continue constantly in the Practice of them.

TYRO. I am obliged to you, and I hope I shall never live to see *that* Day to be a Companion with these Scoffers. However, if it be agreeable to you, we will at present pass them by as un-



worthy our further Notice ; and therefore, I will beg the Favour to ask you more particularly concerning the Christian Religion, as it now stands, with the different Opinions of the various Sects and Professors of Christianity now among us.

PHILO. I will give you an Account of every Thing as far as I can.

## S E C T. V.

*Shewing that the Holy Scriptures teach us more of the Knowledge of God, and our Duty to each other, than any other Systems.*

TYRO. What do you fully understand by the Word *Scriptures* ?

PHILO. The sacred Oracles of God declared to Man, and conveyed to us by the Writings of certain inspired Men, called *Prophets* and *Apostles*.

TYRO. How are the Scriptures divided ?

PHILO. Into two Parts, one called the *Old*, and the other the *New Testament*.

TYRO. What does the *Old Testament* chiefly set forth ?

PHILO. The *Old Testament* shews us plainly, (1.) That there is a God. (2.) That he created the Heavens and Earth, and all Things therein. (3.) That he made Man after his own Image, in Righteousness and true Holiness. (4.) That Man fell from this original Righteousness, which rendered him obnoxious to the divine Wrath, and drew upon himself and his Posterity, Trouble, Sorrow, Sickness, Diseases, Pain and Death. (5.) That God destroyed the Inhabitants of the first Age of the World by a Deluge of Water, eight Persons only excepted. (6.) It tells us also, how God revealed himself to *Abraham* in the promised Seed, out of whose Loins should come forth a Redeemer to lost Man. (7.) It informs us that *Jacob* prophesied of the certain coming of this Redeemer Messiah. (8.) It shews also the Laws, Statutes, and Ordinances given by God to his Servant *Moses*, for the better regulating the Life and moral Conduct of the *Jews*, and by which were signified to them, under various Types and Shadows, the Truth of his Promise made before to *Abraham*, their Father, concerning Christ. (9.) Here we see the binding and necessary Obligation of Man to God, summed up in the Ten Commandments given to the Children of Israel. The Prelude to them positively declares the Existence of a God, from God's own Mouth — *I am the Lord thy God*. Then he proceeds to lay before them his Will and Law, set forth in two Tables of Stone (comprehended in Ten Commandments) for their further Knowledge of their Creator, and the better regulating their Conduct in every moral Duty of Honour and Honesty.

1. The

1. The *first* positively declares there is but one God.
2. The *second* is a further Declaration of his Will concerning himself, and strictly enjoins us not only to believe and adore God alone, but that we should have such reverend Regard for his very Name, and such Thoughts of his Immenfity and Goodness, as not to dare to paint, carve, or form any Image, Similitude, or Likeness whatsoever to represent God, much less to fall down and worship it: For he has declared himself jealous, and that he will not give his Honour to another.
3. The *third* informs us, that the very Name of God is so sacred, that we are never to mention it but with the *highest* Reverence, much less to take it in vain, in swearing by it, and using it upon every light and frivolous Occasion.
4. The *fourth* enjoins us to a particular Observation of the Sabbath, (or *Sunday*) and plainly tells us, that it is God's express Will that it should be kept holy; and that we not only abstain from all worldly Business, but be well employed in Prayer and Meditation all the Day long. Too true it is, that the Sabbath is become a Day of Pleasure, and one fashionable Sabbath-breaker is followed or persuaded by another, not only to neglect all Manner of Duty both public and private, but even to commit all Manner of Sin in public and in private: But if God was so severe, to cause a Man to be put to Death, only for gathering a few Sticks on his holy Day under the Law; what will be the Punishment, or what can they expect, who perpetually profane it under the Gospel, I must leave to their own Reflexion and Consideration.
5. The *fifth* Commandment is also the positive and declarative Will of God to all Children, against the unnatural Sin of Disobedience: For herein God enjoins us not only to *obey* our Parents in all lawful Things, but likewise to *honour* and *reverence* them. And indeed the very Ties of Nature, and the natural Obligations to the Performance of this Duty, are such, that (without any positive Command) one would hardly expect to find so shameful a Neglect of it; but more especially as God himself has so closely enforced it, and all Nations agree concerning the indispensable Duty and Obligation that every Child lies under to perform it, without Distinction of Age or Sex \*.

\* I would not have it thought that I mean here to dictate, or find Fault with the Ministers and Brethren of the various Sects among us.— But this I may venture to say, that the Subject of all relative Duties have not, nor is not enforced from the Pulpit so often as it should be.—For I persuade myself, that were they preached upon oftner, and in a proper, impartial and persuasive Manner, it would tend much more to the Peace and Harmony of Families, and the Honour and Glory of God, than dwelling upon controversial Points and eternal Disputations. See *Dr. Bishop Patrick*, and also *Fleetwood's Relative Duties*.

6. The

6. The *sixth* declares God's positive Command to abstain from that abominable and detestable Sin of Murder; and under this may be easily perceived, that all indirect Means taken to destroy our own or the Health of others, either by Drinking, Debauchery, Vexations, &c. come in some Measure within the Limits of this Command, and are a Breach thereof.

7. The *seventh* Commandment tends to promote Chastity; Adultery, and all Uncleaness, being positively forbid by God, it being contrary to his Nature, and therefore the more *chaste* and *sober* we are, the nearer we approach to our Creator.

8. The *eighth* forbids very strictly the Sin of Theft; that we are not to rob our Neighbour of his Property, by stealing from his Person, House, or Premises, any Part of his Goods or Effects. It also binds us to abstain from all Manner of Pilfering, all Frauds, Monopolizings, and Over-reaching.

9. The *ninth* Commandment is not only a positive and strict Charge against the Sins of wilful Lying, false Witness, and corrupt Perjury, but even against the Sins of Uncharitableness and Detraction. For we are herein required to abstain from all sly Insinuations, and speaking privately against our Brethren, back-biting them, and robbing them of their Character, good Name, and Reputation; and we are also to take Care not to give Ear to any little nasty mean Tales or Stories, that may prejudice our Neighbour, much less to spread and propagate them at Random: Therefore, if Mankind in general would but consider the golden Rule, *of doing to others as they desire and expect to be done by*, they would discourage Things of this Sort; and by shewing a faithful and honest Spirit accordingly, they never would fail to frustrate the Design of such mischievous *Designers*, and might prevent a great deal of Strife, which otherwise must naturally follow, when such invidious designing Persons are smiled upon, caressed and left wholly to the Liberty of an ungoverned Tongue, by our Taciturnity and Connivance.

In short, nothing more plainly discovers both a revengeful Spirit and an uncharitable Disposition, than the constant Practice of Talebearing, and the Delight in hearing them. See *Ecclesiast.* Chap. xxviii. ver. 8, 9, 10, 11, &c. Chap. xxi. ver. 25, 26, and 28.

10. The *tenth* and last Commandment not only forbids the Sin of Covetousness (which is more particularly taken by some for grasping after Riches) but teaches us to bridle and restrain the inordinate Passion of our Desires in lusting, longing, and wishing for those Things which belong to others; and to take particular Care not to envy those whom Providence has thought fit to place in a superior Station of Life, but to be content and easy in that Condition, faithfully discharging our

Duty in that State of Life unto which it has or shall please God to call us.

Thus speaketh the moral Law given by God to the Jews, and is now binding to us as well as them, as is confirmed not only by the Apostles, but by Christ himself, who says, — *Thou shalt love the Lord thy God with all thy Heart, with all thy Mind, with all thy Soul, and with all thy Strength—And thy Neighbour as thyself*—To which he further adds, saying—*On these two Commandments depend all the Law and the Prophets.*

TYRO. What more does the *Old Testament* contain?

PHILO. Not only the moral Law, containing what we are commanded to do; but also the Example of many good and wise Men, whose Practice and Patience are Lessons for us to copy after, and their Writings worthy our constant Perusal and Attention, as witness the Book of *Job*, the *Psalms* of David, the *Proverbs* of Solomon, and his Book of *Ecclesiastes*, all which far surpasses all the Writings and Sayings of the antient Philosophers.

TYRO. I am of your Opinion, indeed, Sir.

PHILO. I am glad of it, *Tyro*; but even these do not come up to the Spirit and Grandeur of many of the Prophecies, particularly those of *Isaiab* the Prophet, in which Book, are such sublime Sentences and exalted Expressions, that it would have been impossible for any Man, divested of supernatural Gifts, to have done the like, much less to foretell the coming of the Lord in the Flesh, and the State of the Church, respecting both *Jews* and *Gentiles*, as they all have done, of which the *New Testament* is a sufficient Witness.

## 2. Of the New Testament.

TYRO. What do you mean by the *New Testament*?

PHILO. That Part of the Holy Scriptures, which were written by inspired Men, after the Ascension of our Lord Jesus Christ; giving a true and concise Account of his Birth, Acts, Miracles, Sufferings, Death, Resurrection, and Ascension, agreeable to the Prophecies of the *Old Testament*, and to which they themselves are undeniable Witnesses, that the same Prophecies were true, and completely accomplished in him; and therefore are more particularly and emphatically called the Apostles of Christ.

TYRO. What does the *New Testament* principally teach us?

PHILO. The chief and principal Point of all, no doubt, is this. (1.) That we should firmly believe that Jesus Christ is come in the Flesh. (2.) That he led a holy and unspotted Life, went continually about doing Good. (3.) That he was crucified for our Sins, and offered unto God the Father a full, perfect,



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## 2. Of the *New Testament*.

TYRO. What do you mean by the *New Testament*?

PHILO. That Part of the Holy Scriptures, which were written by inspired Men, after the Ascension of our Lord Jesus Christ; giving a true and concise Account of his Birth, Acts, Miracles, Sufferings, Death, Resurrection, and Ascension, agreeable to the Prophecies of the *Old Testament*, and to which they themselves are undeniable Witnesses, that the same Prophecies were true, and completely accomplished in him; and therefore are more particularly and emphatically called the Apostles of Christ.

TYRO. What does the *New Testament* principally teach us?

PHILO. The chief and principal Point of all, no doubt, is this. (1.) That we should firmly believe that Jesus Christ is come in the Flesh. (2.) That he led a holy and unspotted Life, went continually about doing Good. (3.) That he was crucified for our Sins, and offered unto God the Father a full, perfect,

perfect, and sufficient Sacrifice for us. (4.) That God the Father accepted this Sacrifice and Attonement. (5.) That he rose again the third Day from the Dead. (6.) That this is a Token or Confirmation of our Resurrection also. (7.) That he ascended into Heaven, and there maketh continual Intercession to God for us; and, (8.) That he will come again from Heaven to judge both the Quick and Dead, and will render to every Man according to his Works done in the Body, whether they be Good or Evil. *Hebrews*, Chap. i. ver. 3. Chap. ii. ver. 9, and 17. Chap. vii. ver. 25. *St. John*. Chap. v. ver. 28, 29. *1 Cor.* Chap. xv. *1 Thess.* Chap. i. ver. 7, 8, 9. 10. and many other Places. — Thus far concerns the Matter of our Faith and Belief—Next follows our Practice.

TYRO. What does the *New Testament* teach us concerning our Carriage, Deportment, and Oeconomy?

PHILO. Every Thing consistent with our Faith and Belief, not only forbidding us to abstain from every Vice, but in every Part charges us to follow all Christian Virtues, according to the Example of him, in whom we believe; and agreeable to the Practice of all his Apostles and true Disciples.

TYRO. I confess (with shame!) that since I have been grown up, I have not read so much of the Scriptures as I should have done; and I own that one Reason has been, I have often heard them spoken of, in a very indifferent Manner, *viz.* that they contradict one another, were only contrived to frighten Mankind; and that no Man in his Senses can believe such marvellous, miraculous, and supernatural Stories, as are there inserted.

PHILO. I am pleased with this free and candid Confession.—But let me ask you one Question: You say, you used to read the Bible but seldom; pray tell me as frankly upon what Motive, or with what View or Design did you read?

TYRO. I suppose upon the same Motive as all deistical Persons do, and that was to hunt after and pick out all the seeming Contradictions, which I was extremely proud to find, as I knew it would be a Feather in my Cap at our next Meeting.—However, it is not so now; for I own it is the best and most useful Book in the World.

PHILO. And so would many thousands more besides you, were they to read it often, with due Attention and Impartiality—And why should they not? There is a perfect Harmony and Agreement between the *Prophets* of the *Old*, and the *Apostles* of the *New Testament*, concerning the System of our Redemption; and therefore it is a foolish Criticism, to carp at, and cavil about the historical Part only, which is not at all material to us, and quite foreign to the principal Design

sign of those inspired Writers, whose Business was chiefly to proclaim the glad Tidings of Salvation.

TYRO. I am now very sensible of it, *Philomathes*.

PHILO. But that which surprizes me most is, that any Man pretending to know Sense and good Manners, should think he shines in Wit, because he is polite enough to ridicule the Scriptures.—And yet Numbers of these Deists are great Pretenders to, and great Pleaders for the Performance of all the Rules of moral Virtues. Behold, what Injustice and Inconsistency here is!—Can *Seneca* or any of the heathen Philosophers furnish us with such Rules of all moral Virtues, or have any of them ever expressed themselves so beautifully concerning Prayer and Praises to God, and all the relative Duties of Mankind to one another in every Station and Degree of Life.—Let them read *Moses's* constant Charge to the Children of *Israel*, the *Psalms* of *David*, the incomparable Books of *Proverbs* and *Ecclesiastes*, in the *Old Testament*; then *Christ's* Sermon on the Mount, the Epistles of *St. Paul*, *St. John* the Divine, and *St. James* in particular, in the *New Testament*; and then let them see whether all Manner of Vice is not forbidden, the bad End it tends to evidently pointed out, and every social and Christian Virtue highly promoted.—Nothing is herein wanting or defective.—Here is set forth evidently the Duty of *Kings*\*, *Subjects*, *Husbands*, *Wives*, *Parents*, *Children*, *Masters*, *Servants*, and of all Mankind one towards another, in all their different Stations of Superiority and Subordination.—The Holy Scriptures teach us the following Virtues, viz. *Affability*, *Amity*, *Beneficence*, *Benevolence*, *Brotherly-Love*, *Charity*, *Chastity*, *Comity*, *Equity*, *Fidelity*, *Friendship*, *Fortitude*, *Honesty*, *Honour*, *Hospitality*, *Humility*, *Humanity*, *Justice*, *Liberality*, *Lo ving-kindness*, *Longanimity*, *Mansuetude*, *Mercy*, *Modesty*, *Prudence*, *Sincerity*, *Sobriety* and *Temperance*.—Can the Enemies of these sacred Writings say the contrary?—Go then, thou partial *Deist*, thou Pretender to the Love and Practice of Morality—go forthwith and learn Lessons out of that Book, which thou hast so long despised, that thou mayest escape the Judgment which it pronounceth against all obstinate and unrepenting Scoffers of God's Word.

TYRO. What you have said in the Praise of the *Old* and *New Testament* is very true; and I am sensible, that the Reason why so many speak against them, is chiefly owing to what they hear others say, and never seeking any farther; but would they but

\* Though I have here mentioned Kings before Subjects, in Order, yet the relative Duties and Obedience begin with the Inferiors first, that is, with the Subjects, Wives, Children, and Servants; then follow the Duties of the Superiors in return, which are equally obligatory.



be resolved to read them often, and with a Spirit desiring to be improved, I might venture to say of *them*, as an eminent Author says in Praise of *Milton's Paradise Lost*; "The oftener we read it the more *Beauties* we discover."

PHILO. You are very right.

TYRO. Thus far, then, dear *Philomathes*, you and I agree; and now I should like you would give me some Account of the Rise and Progress of Christianity, and the different Tenets and Principles of the various Sects now among us.

PHILO. You require too much to be here performed; however, I will do all I can.

## S E C T. VI.

*Of Judaism, Paganism, Christianity, and Mahometanism.*

TYRO. What do you mean by *Judaism*?

PHILO. 1. The Custom, Religion, Manners, and Profession of the *Jews*, according to the Ceremonies of the Law only.—They were first called *Hebrews*, from *Heber*, the Father of *Abraham*; and *Israelites* from *Jacob*, whom God called or named *Israel*; and afterwards they were called *Jews* from *Judab*, *Jacob's* fourth Son. So also the Land of *Israel*, the Land of *Judab* or *Judea*, are the same thing.

2. The History of the *Jews*, their Rise and Bondage, their great Deliverance from it, the Law of God given to them, their Ceremonies and Manner of Worship, you have at large in the *Pentateuch*, or the five Books of *Moses*, called *Genesis*, *Exodus*, *Leviticus*, *Numbers*, and *Deuteronomy*. Here may be seen, their perpetual Deliverance from strange and powerful Nations, and at the same time their perpetual Ingratitude, Unthankfulness, and Murmurings, not only against *Moses*, but even against God himself; till the Lord was so provoked with them as to destroy at one Time above 14,000 (*Numb. Chap. xvi.*) and at another Time of a Plague 24,000 (*Chap. xxv.*) with many other Instances of his Judgments; and notwithstanding this, they kept continually murmuring against the Lord and his Servant *Moses*, provoking him to speak rashly and unadvisedly with his Lips; so that at last, God told him, neither he nor they should ever possess the promised Land of *Canaan*; and accordingly *Moses* died on Mount *Horeb*, and their rebellious Carcasses fell in the Wilderness.

3. It also evidently appears, that *Moses* foresaw that this continual and stubborn Behaviour would certainly end in their final Destruction, without a Reformation of their Manners and Conduct; and therefore, it is worthy our Observation to see the Love he bare to them, notwithstanding their Ingratitude. For before

his

his Death he expressed himself to them in such a pathetic Manner, and gave them such fine Lessons in every Part of their Duty, to be performed both to God and each other, that perhaps cannot be paralleled for Love, Beauty, and Eloquence. See *Deut.* Chapters iv. v. vi. vii. viii. ix. and xxxii.

4. After the Death of *Moses*, *Josbua* became their Head and Leader, and he conducted them over the River *Jordan*, fighting all their Battles, in which he was victorious over all the Nations that opposed him, till he brought them into the Land of *Canaan*, according to God's Promise.

5. After the Death of *Josbua* they had no particular Leader or Guide, but every Man did that which was right in his own Eyes, running after the Gods of the Heathen Nations; making to themselves *Teraphims* or household Images, forsaking the Covenant of the Lord their God, going to every Mount and Valley, and under every green Tree, to worship the false Gods of the *Egyptians*, the *Ammonites*, the *Moabites*, the *Philistines*, the *Zidonians*, &c. and not only this, but they got to such a Pitch of abominable Wickedness, as even to make their Children pass through the Fire; and even offered their Sons and Daughters to Devils. *Judges*, Chap. xvi. and xvii. *Numb.* xxi. and xxii. *2 Kings* xvii. *Ezek.* viii. *1 Kings* xi. read also the Books of the Prophets *Isaiab*, *Jeremiah*, *Ezekiel*, &c.

6. The Government or State of the *Jews* has undergone various Changes, *viz.* (1.) It was *patriarchal*, when the Fathers of every Family were Kings and Priests in their own Houses; and after their Decease the First-born had the same Power, to take in, cast out, give, or disinherit, bless, curse, and punish with Death, &c. (2.) After this it was *dictatorial*, under the Power and Command of *Moses* and *Josbua*. (3.) It afterwards became *aristocratical* in the Time of the Judges, and also the Intervals between the Death of one Judge and the choosing of another, for then they were ruled and judged by the *Sanhedrim*, *viz.* by the Authority of the great Court of the seventy Elders. (4.) After this it was *monarchical* under *Saul*, their first King, and so continued in *Judah* till their Captivity, which was about 320 Years. (5.) In the Time of their Captivity they were under various Changes of Government, from *Zerubbabel* to *John Hircanus*. (6.) They again became a *monarchical* and regal State, under twelve different Kings.

7. The *Jews* acknowledge the written Law of *Moses*, comprehending the ten Commandments, &c., but they prefer the *Oral* Law much before it; for they say *this* is the Explanation or true Annotation of the written Law; and that it was given to *Moses* in the Mount at the same Time the written Law was given; that he communicated it to *Josbua*; *Josbua* to the se-

venty Elders ; these gave it to the Prophets ; from thence it came into the great Synagogue ; and there by the wisest *Rabbis* it was digested into Order ; and when finished, was called the *Talmud*, or Holy Book, being, they say, the very Foundation of the written Law of *Moses*, as that is very scanty and deficient, and the *Talmud* explains all the doubtful Passages, and is so fine a Supplement, that nothing is to be compared to the most holy *Talmud*.

8. The Ceremonies and Worship of the Jews are so many and so different, it would be impossible to speak of them in their Place ; but concerning their Opinions, thus much may be said, That they believe in one God only, the Creator of Heaven and Earth : That he is self-existent, immortal, absolute, and irresistible : That he alone is to be worshipped, and that without a Mediator : That he knows and governs all our Actions : That *Moses* was the greatest Prophet of all others : That the Law which was given to him is of divine Authority, and delivered by divine Inspiration : That all its Precepts are immutable, and that we are to do what this Law commands, and avoid what it forbids : That the Messiah will come at the End of Time, and the Dead shall be raised, and every Man be judged according to his Works.

9. The *Jews* did always, and do still observe and keep certain Feasts or Festivals, viz. (1.) Their Sabbath. (2.) The Passover, or Feast of unleavened Bread, kept at *Easter*. (3.) Their Pentecost, kept at *Whitsuntide*. (4.) The Feast of Tabernacles, kept for seven Days, during which Time they used to live in Booths, &c. (5.) The Feast of Trumpets. (6.) The Feast of Atonement or Expiation. (7.) The Feast of new Moons, being the first Day of their Months. (8.) The sabbatical Year, or Year of Rest, being every seventh Year, in which they neither tilled the Ground, sowed or reaped ; this was in Commemoration of the Sabbath itself. (9.) The Feast of Dedication. (10.) The *Purim*, or Feast of casting Lots. (11.) The Year of Jubilee, called the Sabbath of sabbatical Years, or every *fiftieth* Year, at which Time or Feast all Places or Estates returned to those who sold them, and all Slaves were set at perfect Liberty, &c.

10. The Orders of Men among them were, (1.) The High-Priest, of which *Aaron* was the first, and his first-born after him in lineal Descent. This first High-Priest, *Aaron*, was undoubtedly a lively Image or Type of our High-Priest the Son of the living God. *Hebr.* Chapt. iii. and v. (2.) The common Priesthood, which belonged particularly to the Sons of *Levi*. (3.) The *Netbenims* (which were no *Jews*, but *Gibbenites*. *Jos.* ix.) who were Hewers of Wood, and Drawers of

Pro.

Procurers of Water, and were Singers in the Service of the Temple. (4.) Elders or Ministers of the Synagogue, some of which were called, (5.) *Sheliach Zibbor*, or the Messenger or Angel of the Church. (6.) The *Chesanim*, or Overseers, who had the Charge of the Synagogue, and kept the Book of the Law, and *Liturgies*, and all the Utenfils. (7.) The *Chazan*, who stood by to overlook and direct those who read the Law and the Prophets. (8.) The Interpreter, whose Province was to render the Lessons which were read to the People in *Hebrew* into the *Chaldea* Language, the common People having quite forgot the *Hebrew* Tongue in the Time of their Captivity. (9.) The *Text* itself, or Portion read or taken out of the Law of *Moses*, the *Jews* call *Torah*, and the *Explanation* or *Paraphrase* upon it, they call the *Targum*.

#### Of the SECTS of the *Jews*, &c.

1. The *Pharisees*, who were the most noted Sect among the *Jews*, and in respect of which the others were called *Dissenters*: They professed or received the written Canon of the Scripture, and held all Manner of Traditions, and Superstitions of their own Invention; they are particularly pointed out for their Pride in choosing the chief Seats at all public Assemblies, were remarkable for their going about making long Prayers, to be seen of Men, and to be esteemed in the Eye of the Public more religious than their Neighbours, always watching other People's Actions, and finding Fault with every Trifle, straining at Gnats, and swallowing Camels.

2. *Scribes*; these were of two Sorts, the one taught, transcribed, and interpreted the Law and the Prophets in the Schools; the other belonged to or professed the Civil Law, and were called *Lawyers*.

3. The *Sadducees* were a Sect among the *Jews*, that with the *Pharisees* believed the written Law, and the Doctrines of the Resurrection, Angels, and Spirits; but at last fell away from this and embraced and maintained many false and impious Principles, denying the Resurrection of the Dead, and the Being of Angels and Spirits; they were the very Rise of the *Epicureans*, and our modern *Deists* are greatly indebted to them, for their early Precedent and Example, in denying supernatural Power, and opposing every thing that has not ocular Demonstration.

4. The *Samaritans* were a Sect of mongrel *Jews* or Heathens; some however conformed to the *Mosaic* Law, but rejected all other Traditions, and said that God ought to be worshipped on Mount *Gerizim*, and not at *Jerusalem*. You read in *St. John*, Chap. iv. that the *Jews* hated them so much, that they had no Dealings or Connection with them.



5. There was another Sect, but not of much Note, called *Karrites*; these were such *Jews* as abided wholly by the written Law of *Moses*, rejecting the *Oral Law*, and many other Traditions and Superstitions of the *Jews*. There are many of this Sort among the *Jews* to this Day.

6. *Herodians*, or the Admirers and Followers of *Herod* the Great, whom they honoured with ridiculous Solemnities and Orations, believing him to be the Messiah, at other Times extolled him so as to call him God. See *Matth.* Chap. xiv. *Luke*, Chap. xiii. *Acts*, Chap. xii.

7. *Publicans*; these were only Officers, who collected Tribute, or gathered in the Taxes imposed by the *Roman* Emperors upon the *Jews*, who never could easily submit to such Taxations, therefore hated both the Imposer and the Collectors of such Taxes.

8. Another Set of Officers were called *Masorites*; they examined all the Bible throughout very strictly, and then put the Meaning of the Text, or difficult Word, into the Margin, (which they called the *Kert*) right against the difficult or wrong Word, which they called *Celib*.

Thus much, *Tyro*, for a general Hint of the *Jewish* Religion, Rites, &c. but for the general and particular History of their Wars, Transactions and Vicissitudes of their State, from Time to Time, read *Josephus's* History of the *Jews*.

TYRO. I am highly obliged to you, *Philomathes*.

## S E C T. VIII.

### Of PAGANISM.

TYRO. What is *Paganism*?

PHILO. The Religion of the *Heathens*, or their Adoration and Worship of Idols and false Gods.

TYRO. How and what were the Gods they worshipped?

PHILO. Not only Gods in the supposed Form of Men, such as *Jupiter*, *Mars*, *Bacchus*, *Apollo*, *Venus*, *Diana*, &c. but even Birds, Beasts, Fishes, creeping Things, as also Trees, Plants, and Vegetables.

TYRO. Pray give me an Account of these Heathen Deities, their Pedigree, Titles, &c.

PHILO. I will, as far as Time and Room will allow of, but this I choose rather to do under the Head of *Mythology*, which I shall very concisely treat of hereafter; therefore, we will at present touch upon *Mahometanism*.

## S E C T. VII.

## Of MAHOMETANISM.

TYRO. What is *Mabometanism*?

PHILO. The Profession and Practicè of the Religion or Tenets of *Mabomet*.

TYRO. What are those?

PHILO. (1.) That there is but one God, and he ought to be worshipped. (2.) That the same God raised up various Prophets in the World, and that we ought to esteem them as his Messengers, and obey them. (3.) That *Mabomet* himself was one of the Head of these Prophets. (4.) They believe in Angels and Spirits, the Resurrection and Day of Judgment. (5.) They hold with the Duties of Prayer, Fasting, Alms-giving, &c.

TYRO. Who, and what was *Mabomet*?

PHILO. (1.) *Mabomet* was Son of *Abdollah*, of the Tribe of the *Karaisbies*, his Mother's Name *Amena*: He was born at *Mecca*, a City of *Arabia*, A. D. 571. (2.) His Father dying while he was young, he left him to the Care of his Uncle *Abu Tuleb*, a considerable Merchant, and he used to go with Camels trading to *Syria*. (3.) *Mabomet*, it is said, lived with his Uncle till he was about 25-Years old, at which Time one of his Uncle's Acquaintance, a great Merchant in *Mecca*, died, and left his Effects to *Cadigba*, his Wife, who invited *Mabomet* to transact his Business, which he did, and in three Years after married her, he being then about 28 Years of Age. (4.) *Mabomet*, trading largely to *Egypt*, *Palestine*, and *Syria*, knew well the Opinion both of the *Jews* and *Christians*, and their different Sentiments of Religion; and therefore being well known, and having some persuasive Powers over both, he bethought himself, that the best Way to be admired would be to frame, compose, and broach some new System of Religion, suitable to both Parties, which drew in Numbers of every Sect and Persuasion. (5.) In order to this, he, by Degrees, not only grew very strenuous of all Manner of superfluous eating and drinking as usual before Men, but every Morning withdrew into some solitary Place or Cave, and there (as is reported) spent his Time in Abstinence, Fasting, and Prayer; but others say he resorted to these private Places, with divers Priests and Monks, and consulted with them concerning this new Scheme of Imposture. Those that approved of it, he caressed, and such as did not he discarded, and being now a Man of great Power, his Ambition raised him to the Pitch of Sovereignty; so that at last, whatever *Mabomet* was pleased to speak of, preach, or publish,

few or none dared gainsay or contradict. (6.) Having laid his Plan so well, the next Thing was to make Converts to his new System of Imposture; and therefore begins with his Wife, *Cadigba*, telling her how the Lord had appeared to him in different Places and Times, both by Dreams, Visions, and Voice, and had called him to be a *Prophet* among the People; but she was not easily persuaded into such Stories, and told him she believed they were only Fancies, and Delusions of his own; but *Mahomet*, willing to convert his Wife rather by Persuasion than Force, took into his House a fugitive Monk, Priest or Frier, (whose Name is supposed to be *Zal Abu*, or *Abu Taleb*) and he confirms to her all that *Mahomet* had told her, with the Addition of his having several Times conversed with the Angel *Gabriel*, and that he had himself heard strange and terrible Voices talking with him in Caves and different Places: By this Attestation and other Schemes of Imposture, contrived by *Mahomet*, and his impious cringing Votaries, they at last brought over *Cadigba* to believe every Thing that was said concerning the Mission of her Husband, whom she at last confessed and believed to be a Prophet indeed. (7.) Having by Stratagem made his Wife a strong and powerful Profelyte, he soon made his whole Household so; prevailing upon his Servants and Slaves to adhere closely to his Doctrine, by a Promise of their Freedom: They accordingly accepted it; and he made a Law, which remains to this Day, that all Slaves embracing his Religion or Tenets shall be made free. (8.) Now *Mahomet* acts more openly, and getting some Principals of the City of *Mecca*, he publicly declares himself a Prophet, sent from God to convert them from Paganism to his true Religion. (9.) He was never wanting to assert the constant Attendance and Presence of the Angel *Gabriel*, and as positively asserted that God had raised him up to correct the Errors of all other Prophets, and had revealed his Will and Design to him of every Thing he intended should be done hereafter for the Advantage of his Church on Earth. (10.) *Mahomet*, in order to confirm the Truth of all he said, and jealous of its not being believed by the People in general, proceeds yet further, and says, that God himself by the Angel *Gabriel* gave him an Invitation to his holy Habitation, and accordingly he went. (11.) *Mahomet* also acted strongly upon the Passions of his Followers, by his describing Heaven and Hell as a future Reward of Virtue and Vice: For, as he lived in the Torrid Zone, (where there is no want of Heat) he accordingly tells those Converts that embraced his Doctrine, that they should certainly go to Heaven, and there enjoy Pleasures far beyond Conception, viz. Women, ever young, beautiful, and obliging; shady Walks, ever green, cool, and pleasant; delight:

delightful Rivers and Streams; delicious Fruits of all Sorts, and an eternal, uninterrupted Enjoyment of all Manner of Dainties and Delicacies: But to all such as held him or his Doctrine in Contempt, he pronounced their infallible Condemnation to Hell itself, which he painted out to their Senses in very terrible Shapes; telling them, it was a Place where there was nothing but a hot and scorching Air, black Smoke; their continual Eating would be Briars, Thorns, Cinders, Ashes, and burning Pitch, and their Drink, boiling hot Water, melted Lead, &c.

(12.) *Mahomet*, however, was opposed by many, and being required to work Miracles, or shew some Signs of his Mission, that they might believe; he told them, that God was angry with them for their Disbelief, and therefore would not shew any more Signs and Wonders among them. (13.) *Mahomet* however was resolved to be even with his Opposers, for he got an Army together, and went to *Medina*, and slew all that did not own him as God's great Prophet; telling them at the same Time, that as God had sent *Moses*, *Jesus* and other Prophets, who did Miracles, and they would not believe; he had now sent *him* to chastise them with the Sword for their Infidelity. (14.) *Mahomet* nevertheless knew that the working of Miracles would certainly gain him more Respect, and therefore as he knew he had no Power to work any, he cunningly gets a Set of Men to attest they saw him do many, *viz.* that pure Water streamed from between his Fingers; that the Trees went forth to meet him and follow him; that he once clave the Moon in sunder, and put it together again; that a Shoulder of Mutton once spoke to him; with many more ridiculous Stories, by which *Mahomet* lost the Favour of those, who had any Sense to think at all, and became an Imposture in the Eye of the most sensible Part, both of *Jews*, *Pagans*, and *Christians*.

TYRO. How could he expect any other? Could he imagine such Nonsense as this should be received without Thought and Consideration? However, if you have any thing further to say of his Pranks, let us have them, for they are diverting enough.

PHILO. There is nothing but only his being invited to Heaven; his Converse with God there, and some other ridiculous and blasphemous Things, I think hardly worth your Notice.

TYRO. Pray now, my dear *Philomathes*, give me a little Account of *that*, for I am sure it will divert me more and more.

PHILO. Observe then;



2. Of Mahomet's *Mesra*, or Night-Journey to Heaven, &c.

*Mahomet* not being yet able to make all the People Profelytes, contrives another Scheme, which was to ietire one Night from his own House in a very private Manner, and returned the next Morning; during which Time he was carried to Heaven, had Converse with God himself, and brings back Instructions how to rule the People.—The Story as follows. (1.) *Mahomet* (about twelve Years after his pretended Mission) being in Bed, heard, at the dead Time of the Night, an uncommon knocking at his Door, (which was contrived by him and his cabinet Friends) and starting up suddenly, he tells his Wife, that he knew he had a special Message from God, and therefore hastened down with all Speed, and there found the Angel *Gabriel*, who took him by the Hand, and with a pleasant Countenance told him, that he was sent to conduct him to Heaven, as being a Favourite of God's, and that he would there see Things, and learn Mysteries past Man's Understanding. *Gabriel* had seventy Pairs of large expanded Wings, and brought with him *Alborak*, or the white and holy Mule for *Mahomet* to ride one. (2.) *Gabriel* bids him mount with Speed, but as *Alborak* had not carried any Prophet to Heaven since Christ, he was now grown idle and skittish, and would not suffer *Mahomet* to mount him, till he promised the Beast to get him a Place of Ease and Rest in Paradise. (3.) *Mahomet* by this mounts quietly, and *Gabriel* taking hold of the Bridle, they arrived at *Jerusalem* in an Instant of Time. (4.) *Mahomet* proceeds to the Temple, at the Gates of which he was met by *Moses* and all the departed Prophets, who hailed him, and accompanied him with Joy into the Temple, where they had some Conversation upon his Mission and Journey; and before their parting they all desired his particular Prayers for them, and modestly left him. (5.) *Mahomet* now returning out of the Temple, found a Ladder of Light fixt from the Earth to the first Heaven. *Gabriel* and he ascends it, having first tied [poor] *Alborak* to a Rock, till he returned. (6.) They soon arrived at the first Heaven, which was pure Silver, where he saw *Adam*, who, after thanking God for so great and good a Son, he desired *Mahomet* to remember him in his Prayers. Here he saw also Angels, Men and Beasts, in all Shapes; but particularly a Cock, whose Head reached from the first to the second Heaven, though the Distance was so great that it will take (he says) 500 Years to arrive there. This Cock is decked with Pearls, and God sings or speaks to it every Morning, and then it crows and sets all the Cocks in Heaven and Earth a-crowing also. (7.) From hence they ascended to the 2d, 3d, 4th, 5th, 6th, and 7th Heaven. In the 2d Heaven

he saw *Noah*, in the 3d *Abraham*, in the 4th *John*, in the 5th *Moses*, in the 6th *John the Baptist*, with whom he had much Talk, and they all recommended themselves to his Prayers. He also saw in the 3d Heaven the Angel of Death, the Distance between whose Eyes would take a Journey of 200 Years; who takes an Account of all Persons that ever were born, and when they die he strikes their Names out of the Book. (8.) *Mahomet* now comes to the 7th Heaven, and here he saw Jesus, and after some Talk, desires that Jesus would pray for him. Passing on further, he saw an innumerable Company, one of which he could not help remarking, he having seventy thousand Heads, and in every Head seventy thousand Tongues, and every Tongue utters seventy Thousand distinct Voices at once, praising God Night and Day. (9.) *Mahomet* being now at the seventh Heaven, *Gabriel* tells him he must leave him, but gave him Direction which Way to proceed to the Throne of God; and after passing through Snow, many Floods of mighty Waters, and other great Difficulties, he at last heard a great but gracious Voice, saying, *O Mahomet, beloved of God, salute thy Creator.* — Then he came to a Place which far exceeded the Sun for Light and Brightness: — Here he saw the Throne of God, which surpasses all Thought or Description; on the right Side of which was written in *Arabic*, these Words, LA ELLAH ELLAL-LAH, MOHAMMED RESUL OLLAH, which is, *There is no God but God, and Mahomet his Prophet.* (10.) *Mahomet* then drawing nearer, saw God sitting on his Throne; but did not see his Face, because he had seventy thousand Veils over it; but he says, God laid his Hand upon him, as a Mark of his Favour towards him, but it was so extremely cold that it struck through the very Marrow of his Backbone: But God very tenderly withdrew it, and familiarly entered into Conversation with him; communicating to him the hidden Mysteries of the Law, and invested him with a Power above any other, and laid a particular Charge upon him to communicate the same to all Mankind upon his Return. (11.) *Mahomet* being dismissed from the Presence of God, returns to *Gabriel*, who conducted him back again to *Jerusalem*, where, mounting the white Mule *Alborak*, he returned to *Mecca* the same Night he sat out upon this Journey.

TYRO. A surprizing Relation indeed! But how is it possible for any Man in his Senses to believe any Part of it, since *Mahomet* himself has acknowledged, that the Journey he performed in an Hour and a Half would take up above four thousand Years to complete.

PHILO. He has so; and this shews *Mahomet's* Judgment in *Astronomy* and *Religion* were much alike; for it is evident that  
at

at the Rate of forty Miles a Day, it would take up five thousand five hundred Years to arrive at the Distance of the *Sun* only, whose Distance bears but little Proportion to the Distance of some Stars, or the empyreal Heaven; and therefore consequently falls so infinitely short of the Distance of the highest Heaven, that it will bear no Comparison at all.

TYRO. Very true; but pray how did *Mahomet* manage Affairs after his Return?

PHILO. You must naturally conclude, that some believed what he asserted, and others would nor could not; therefore, it caused Contentions and Insurrections; and the principal Men of *Mecca* were resolved to examine him more closely upon it, and punish him accordingly; but he having timely Notice, fled secretly with his Party to *Medina*, a large City in *Arabia*; there he propagated his new System, built a Place for the Exercise of his new-fangled Religion, and issued out Orders that all Computation of Time should begin the Day of his Flight, called *Hegira*: From hence commences the *Mahometan Era*, which was on *July* the 16th, in the Year of Christ 622.

TYRO. I am obliged to you, *Philomathes*; and how did he proceed in *Medina*?

PHILO. The same as in *Mecca*, always creating fresh Disturbances, by propagating Lies and Impostures; but the People in general not believing his blasphemous Tales, nor embracing his ridiculous Tenets, he (like the Church of *Rome*) takes up the Sword of Chastisement, strictly forbidding all his Soldiers or Disciples to dispute or parly with the Christians, or any other Sect, concerning the Authority of his Mission or Religion, but to cut off all that dare to oppose it, and that would not immediately promise to embrace it. Thus he went on till the seventh Year of his *Hegira* or Flight from *Mecca*, and now proceeds to *Chaibar* in *Arabia*, and was entertained by one *Horesh*, whose Daughter's Name was *Zamath*, and she being no Friend to *Mahomet*, was resolved to try whether he was indeed a Prophet or not; and therefore poisoned a Shoulder of Mutton, which he and his Friends were to partake of one Night at her Father's, and though she was desired to desist from so rash an Undertaking, she said she could not, for that her Conscience was very easy in the Design, as her Heart had continually told her, that she would certainly do God and Mankind great Service, in cutting off such a Tyrant and Impostor. She accordingly did it, and they had not eaten long before *Basber*, one of his great Friends, fell down dead; but the Shoulder of Mutton told the Prophet what was done to it, upon which he spat out what he then had in his Mouth; however, he

had eaten enough to answer *Zamath's* Design, for from that Time he lingered, pined, and wasted away, and died on his Birth-day in the City of *Medina* (being, according to their Account, just 63, and by ours 61 Years of Age) where he was buried, and not suspended in the Air by Means of large Load Stones, as is commonly reported.

TYRO. And what did his Followers do after his Death?

PHILO. *Mahomet* left behind him a Book which he compiled, called the *Alcoran*, or rather *Coran*, containing Rules for their Faith and Practice. This Book is held with such Reverence, that whoever touches it with unwashed Hands is put to Death. It contains nothing but a Series of Hodge Podge, and Inconsistencies; such as the Chapter of the *Elephant*, another of the *Cow*, the *Fly*, &c. &c. The Reason (it is said) that the *Mahometans* hold this Book in such Veneration is, because *Mahomet* told them it was wrote with the Finger of God, upon exceeding fine Parchment, made of the Skin of the very Ram which *Abraham* offered up for a burnt Offering instead of *Isaac* his Son, and God sent it from Heaven to him in a Roll, sealed up by the Hand of the Angel *Gabriel*.

Thus much, *Tyro*, concerning *Mahometanism*, which to this Day is professed in *Turkey*, and several other Places in the East.

TYRO. I am very much obliged to you, *Philomathes*, for this Information: And now, pray give me Leave to remind you of your former Promise of giving me a more particular Account of *Christianity*, and the different *Opinions* of those that profess it.

PHILO. I will.

## S E C T. IX.

*Of Christianity, with a concise Account of the different Opinions, Ceremonies, and Manner of Worship, of the various Professors of it.*

### I. Of CHRISTIANITY.

TYRO. What do you mean by the Word *Christianity*?

PHILO. (1.) *Christianity*, in the general Sense, or common Acceptation of the Word, signifies a true Belief in Christ and his Doctrine, in Opposition to *Idolatry* and *Paganism*. But, (2.) It more strictly implies, not only a bare Belief in Christ, but a constant Perseverance in all good Works; and an Abhorrence of, and abtaining from every Thing that is evil, according to the Doctrine and Examples, which both He himself and his Apostles taught and practised, and which are so evidently set forth to us in the holy Scriptures.—He who does this is a Christian



Christian indeed, without paying any Regard to the Doctrines and Ceremonies of any particular national Church, Sect or People; the Manner of Worship being only the Mode of Religion, but not Religion itself: For all Christians of all Persuasions whatever acknowledge there is but one Way of worshipping God — that is, *in spirit and in Truth*. See St. John, Chap. iv. ver. 24.

TYRO. It is very true, *Philomathes*; and as every national Church has its different Way of Worship, and every Sect among us different Notions of *Theology*, how can I, that am but young, or how can those that are quite ignorant know, when they are right or wrong?

PHILO. Very easily; and that is by a constant Reading and Perusal of the sacred Books of the *Old* and *New Testament*.

TYRO. But you know, Sir, that they are not so easy to be understood by People in general.

PHILO. I grant they are not; but this is no Proof that they might not be better understood than they are, if they were read more constantly and with due Attention. — But alas, *Tyro*, we never want a Plea for any Thing. — (1.) Ask yourself and your Acquaintance, who plead this Ignorance of the sacred Writings, whether you or they have read them so often as you ought to do? (2.) How is it possible to become acquainted with the Knowledge of any Art or Science, without either conversing with Persons that understand it, or attentively reading such Authors as have treated upon it? (3.) The greatest Reason then that the Scriptures are understood no better, is, because they are neglected so much. (4.) This is evident, for you shall meet with Men that are tolerable good Scholars, and profess themselves Members of the Church, who are totally ignorant, not only of the Sense and Meaning of a plain Text of Scripture, but they are almost totally ignorant there is any such a Text or Sentence at all. (5.) If you tell him, you are surprized they don't remember such and such remarkable Passages, they immediately answer, that they have no Memory to retain Things like other Persons. — Behold, what a *seemingly* modest Answer here is, to cover or excuse the Act of a wilful Neglect, since the very same Persons who own their Deficiency in this respect, would take it as a great Affront and Insult, if any one should dare to call in Question their Knowledge, Memory, or Capacity in comprehending and retaining Things in general. (6.) It is evident then, that it is not so much the Want of Capacity or Opportunity, as the Want of Resolution and Delight. Whoever is resolved to read the Scriptures with these two Accompaniments, I dare venture to aver, they will soon understand all those necessary Parts that are proper and sufficient

sufficient for the Instruction, Duty, and Practice of a Christian in every State of Life; and not only this, but would very soon be ready (or capable) to give an Answer to every Man that asketh them of the Reason of their Faith. St. Peter, Chap. iii. ver. 15. (7.) In short, were there an Embargo laid upon the Word of God in Great Britain as there is in the Church of Rome, we might then have a just Plea, but our Situation, you know, is quite different from theirs: For there is no Doubt but many of them would be very glad to read it oftener, but dare not; but every Sect among us, may not only read it when, and where-soever they please, but are even pressed upon and invited to read it oftener, and yet will not. Behold what a strange Abuse of Liberty is here! What a grievous Neglect of Duty is this: To let slip all Opportunities of reading and perusing such Things as would enable us, not only to stand Proof against all the Adversaries and Opposers of revealed Religion; but would furnish our Minds with such a Knowledge which would give us unknown Satisfaction, and turn out much more to our Advantage than we are at present aware of.

2. Of the different Tenets of the principal Sects, or Professors of Christianity.

TYRO. I should be obliged to you, *Philomathes*, to give me a short Account of the Tenets of the various Professors of the Christian Religion.

PHILO. That would be almost impossible; therefore, you must be content if I tell you no more than the Tenets, Articles of Faith, and Manner of Worship of the Professors of the three principal Churches in Europe, viz. the Church of Rome, the Church of England, and the Dissenters.

1. Of the Church of Rome,

TYRO. What do you mean by Roman Catholics, or Papists?

PHILO. The Followers or Professors of the Doctrine of the *Romish* Church, or Papistry.

TYRO. What are the principal Tenets of the Church of Rome?

PHILO. They say or believe, (1.) That Jesus Christ is one of the Persons in the most Holy Trinity. (2.) That he came from Heaven, took our Nature upon him, and suffered Death upon the Cross. (4.) That before he ascended to Heaven he invested the Apostle *Peter* with the Power of Infallibility. (5.) That he gave to him the Keys of Heaven and Hell, with a full Power of remitting or retaining the Sins of

Men. (6.) That in the Year of Christ 42, the Apostle *Peter* went to *Rome*, and governed the Church there as supreme Bishop above 24 Years, and was at last crucified with his Head downwards. (7.) The *Roman Catholics* believe, that the same Power and Authority which was vested in the Apostle *Peter* descended to every next successive Bishop or Pope of *Rome*, by an uninterrupted Succession. (8.) Every successive Pope, therefore, they say, is God's Vicegerent, and supreme Head of all Nations, and of every nominal Church on Earth. (9.) They are further taught to believe that he has a Power to create or set up Kings, and to depose them; and to ordain Bishops and Priests, and excommunicate them at Pleasure. (10.) They believe that the Pope has a Power to grant Indulgences to break through all Oaths and Promises, and to allow of all Manner of Sins, and then absolve them. (11.) They believe in a *Purgatory*, or Place of Fire, to purify the Souls of the departed; and that the Priests by offering up or saying Mass, can deliver their Souls from this State of Prison and Misery, and transfer them into Joy and Bliss \*. (12.) They believe that Jesus Christ, after he was crucified, descended personally into Hell, and released from thence all the Souls of the former Saints. (13.) They assert that the blessed Virgin *Mary* is the Mother of God, and that she atones for the Souls of them that adore and worship her on Earth: Therefore her Picture, with the Pictures of other Saints, ought to be had in great Respect and Veneration. (14.) They profess to do Works of Supererogation, and therefore they frequently sell good Works to the ignorant, and tell them that they will expiate any Crime. (15.) Their mendicant Priests go in a very nasty and bad Dress to make the Laity believe what Poverty they suffer for the Name of Jesus, though at the same Time they are very rich; for by this crafty Piece of Hypocrisy they excite Pity and Compassion, and get a great deal of Money. (16.) They believe there are seven Sacraments, viz. *Baptism*, *Confirmation*, the *Eucharist*, *Penance*, *extreme Unction*, *Orders* and *Marriage*. (17.) They forbid the eating of Flesh in the Time of Lent, and on certain fast Days; but notwithstanding their strict Orders of Abstinence and Fasting, they will eat, gorge, and gormandize Fish and other things most profusely. Thus, *Pharisee*-like, they strain at Gnats and swallow Camels. (18.) They impose upon the Ig-

\* It is to be observed, that those who leave Legacies to the Priests, or have rich and good Friends, their Souls are constantly prayed for, though 'tis many Years before they are released, and cost a great deal.—But Dean *Swift* says, no Money no *Pater Nosters*; therefore the Poor may lie in *Purgatory* and be d—mn—d.

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norant and Unthinking, to believe the ridiculous Doctrine of *Transubstantiation*; that is, after the Priest has blessed or consecrated the Bread and Wine in the Sacrament, the Symbols or Elements are then no more Bread and Wine, but really the very Body and Blood of our Lord Jesus Christ: And what renders this so shocking is; that though they impose it upon the Laity as a very material Article of their Faith; they themselves know it is quite repugnant to Faith itself, is a self-evident Contradiction to the Word of God, and the philosophical Law of Matter, and immediately contrary to Reason itself. (18.) Notwithstanding these abominable and flagrant Absurdities, yet they are very jealous and zealous in the Cause of their Religion, or rather Superstition, making it a damnable and heinous Sin in all such as will not adhere most strictly to their infallible Dictates. (19.) They are exceedingly laborious to gain Converts, by a particular Method and a long unwearied Patience and Diligence in every Country but their own, to bring over ignorant Souls by Flatteries and fair Promises; but it is not so where they have Power, for then they insist upon a Belief and Compliance with every thing; otherwise their Love is turned into Cruelty, their Zeal into Inhumanity, and their Persuasions into bloody Inquisitions. (Lastly.) These and many other ridiculous Impositions, and many Cruelties continually imposed upon the Consciences and Persons of Men in all Nations, occasioned a large Body of People to *dissent, separate* from, and *protest* against Popery or the *Romish Church*, and therefore are called *Protestants*, be they of what Sect or Denomination they please; and the Church of *Rome*, without Distinction, call all such Protestants *Heretics*, and they all partake of her *Anathema's* and execrable Curses to this Day.

TYRO. One would hardly believe that a Church which pretends to have its Sanction from God, and its Examples from his holy Apostles, can possibly be so ridiculous in its Principles, and so cruel in its Practice.

PHILO. This the History of all Nations ever allowed of; *England* has severely felt her Rod, and the *Protestants* of many neighbouring Nations are not Strangers to her superstitious Follies and her cruel Inquisitions and Persecutions to this Day.

N. B. As there are many Persons who are not easily persuaded that the Tenets of the Church of *Rome* are so bad as are generally spoken of, I have been the more particular in pointing them out; and as there are many of the *Roman Catholic* Persuasion, who would fain possess the more ignorant Part of Mankind, that the Church of *Rome* is the best of Churches, and that the Stories concerning the many Cruelties against the Protestants are all false: But that the Reader may see what Love they bear to all other Sects and Persuasions of Men, I



thought proper to insert the following Lines, in order to caution every Person to take Care how they are led aside by the plausible Insinuations of her Priests, or the pretended Love of her Emissaries, while they lie perpetually under their execrable Curses and Imprecations.

Here follows the Popes dreadful Curse upon Heretics; being the solemn Form of their *Excommunication*, and which may be seen in the Ledger Book of the Church of *Rochester* in *Kent*.

The Pope being seated, and every Thing ready for such a Solemnity, He, or some Delegate appointed, pronounces against all other Churches, Sects, and Persuasions of Men, as follows.

1. *The Declaration alone.*

“ By the Authority of God Almighty, the Father, the Son, and the Holy Ghost; and also of the holy Canons, and of the undefiled Virgin *Mary*, Mother and Patroness of our Saviour, and of all the celestial Virtues, Angels, Arch-angels, Thrones, Dominions, Powers, Cherubims, and Seraphims; and of the holy Patriarchs, Prophets, Apostles, Evangelists, and of all the holy Innocents, who in the Sight of the Holy Lamb are found worthy to sing the new Song of the holy Martyrs, holy Confessors, holy Virgins, and of all the Saints, together with all the Holy of God, we do hereby, excommunicate and anathematize *him* or *them*, Malefactor or Malefactors. — And from the Thresholds of the holy Church of God Almighty, we sequester that *he* or *they* may be tormented, disposed of, and delivered over with *Dathan* and *Abiram*, and with those that say unto the Lord God, Depart from us. And as the Fire is quenched with Water, so let the Light of *him* or *them* for evermore, unless it shall repent *him* or *them* to make Satisfaction. *Amen.*”

2. After this Declaration the Curses follow, which are repeated by the whole Assembly, then gathered together.

“ (1.) May the Father, which created Man, curse *him* or *them*. (2.) May the Son, who suffered for us, curse *him* or *them*. (3.) May the Holy Ghost, who was given to us in Baptism, curse *him* or *them*. (4.) May the holy Cross, which Christ for our Salvation triumphing over his Enemies, ascended, curse *him* or *them*. (5.) May the holy and eternal Virgin *Mary*, Mother of God, curse *him* or *them*. (6.) May St. *Michael*, the Advocate of holy Souls, curse *him* or *them*. (7.) May all the Angels and Arch-angels, Principalities and Powers, and all the heavenly Hosts, curse *him* or *them*. (8.) May St. *John*, the chief Forerunner of Christ, curse *him* or *them*. (9.) May St. *Peter*, St. *Paul*, and St. *Andrew*, and all other of Christ's Apostles, together with the Rest of his Disciples, and four Evangelists, who by their

“ preach.

“ preaching converted the whole universal World, curse *him* or  
 “ *them*. (10.) May the holy and wonderful Company of  
 “ Martyrs and Confessors, who by their holy Works are found  
 “ pleasing to God Almighty, curse *him* or *them*. (11.) May the  
 “ holy Choir of the holy Virgins, who for the Honour of Christ  
 “ have depised the Things of this World, curse *him* or *them*.  
 “ (12.) May all the Saints, who from the Beginning of the  
 “ World to everlasting Ages are found to be beloved of God,  
 “ curse *him* or *them*.

“ (13.) May *he* or *they* be cursed wheresoever they be, whether  
 “ in their House, or the Field, or the Highway, or the Path, or  
 “ in the Wood, or in the Water, or in the Church. (14.)  
 “ May *he* or *they* be cursed in living, in dying, in eating, in  
 “ drinking, in being hungry, in being thirsty, in fasting, in  
 “ sleeping, in slumbering, in waking, in walking, in standing,  
 “ in sitting, in resting, in p—ss—g, in sh—tt—g, and in  
 “ Blood-letting.

“ May *he* or *they* be cursed in all the Faculties of their Body.

“ (16.) May *he* or *they* be cursed inwardly and outwardly. (17.)

“ May *he* or *they* be cursed in the Hair of *his* or *their* Head.

“ (18.) May *he* or *they* be cursed in *his* or *their* Brain. (19.)

“ May *he* or *they* be cursed in the Top of *his* or *their* Head, in  
 “ their Temples, in their Forehead, in their Ears, in their  
 “ Eyes and Eye brows, in their Cheeks, in their Jaw-bones,  
 “ in their Nostrils, in their Teeth, in their Lips, in their  
 “ Throats, in their Shoulders, in their Wrists, in their Arms,  
 “ in their Hands, in their Fingers, in their Breast, in their  
 “ Heart, and in the interior Part of their Stomach, in their  
 “ Reins, in their Thighs, in their Genitals, in their Hips, in  
 “ their Knees, in their Legs, in their Feet, in their Toes, in  
 “ their Nails. (20.) May *he* or *they* be cursed from the Crown  
 “ of their Head to the Sole of their Feet, may there be no Sound-  
 “ nefs in *him* or *them*.

“ (21.) May the Son of the living God, with all the Glory  
 “ of his Majesty, curse *him* or *them*, and may Heaven, with  
 “ all the Powers that move therein, rise up against *him* or *them*,  
 “ to damn *him* or *them*, unless they shall repent, to make Satis-  
 “ faction. Amen. Amen. So be it.”

TYRO. Never did I hear any thing so shocking as this is! I should think this very unpolitical as well as wicked.

PHILO. In *Italy*, and Places more immediately under the Pope's Jurisdiction, it may perhaps be political; but plain it is, that through this *absolute, tyrannical, and persecuting* Spirit, the Church of *Rome* has lost Ground, and has been a sinking Church ever since the glorious Reformation under *Martin Lutber* in the Reign of *Harry the Eighth*, *Ann. Dom. 1517*, and *she* is de-

spised by all Nations on Account of her Cruelties and Persecutions. Read *Henry* and *Whiston*, as also the Margin of *Queen Elizabeth's Bibles* on the xiii. xiv. xv. xvi. xvii. xviii. and xix. Chapters of the *Revelations*.

TYRO. You are extremely obliging, and I am as thankful; and now pray tell me what followed after the Reformation?

PHILO. The established Church, commonly called the Church of *England*.

## 2. Of the Church of England.

TYRO. What do you mean by the Church of *England*?

PHILO. The Religion and Worship of the People of *England*, as by Law established, and it is governed by two Arch-bishops, Bishops, and inferior Clergy, of which the King is Head.

TYRO. What are the principal Tenets of the Church of *England*?

PHILO. You may see the Principles of this Church very particularly set forth by and in thirty-nine Articles, printed and published in their Book of Common Prayer, or Manner of Worship.

TYRO. But I wish you would give some short Account of the principal Tenets of the Church of *England*, as it may be of Service to such of its Members, who do not really know them; and also remove the Prejudice of many others, who accuse it unjustly.

PHILO. You are very right. Therefore I shall give you an Account of it, according to its own Articles, and not according to the Opinion of modern Writers.

TYRO. Why so, Sir?

PHILO. Because the Clergy themselves are divided into two Sorts; some being *Calvinists*, others *Arminians*.

TYRO. Sir, I am satisfied; proceed then, if you please, to acquaint me with the Admirers of the Church of *England*, according to its Articles or first Establishment.

PHILO. I will. (1.) The Church of *England* has thirty-nine Articles, some contain the Matter of Faith which relate to the Church of God, and others are civil Articles relating to its Government, Order, and Discipline. (2.) The 1st, 2d, 3d, 4th, and 5th Articles set forth that there is but one living and true God; that in the Godhead there are three Persons, Father, Son, and Holy Ghost, all equal in Power, Majesty, and Glory; that the second Person in this Trinity took our Nature upon him, and is both God and Man united in one Christ; that he was crucified for us in the Flesh, was buried, rose the third Day from the Dead, according to the Scriptures, that he ascended into Heaven, and there makes continual Intercession

cession for us. (3.) They own (in Art. nine) original Sin, and that by *Adam's* first Disobedience or Transgression all Mankind are tainted or infected with Evil, have a natural Inclination to Evil, and therefore are obnoxious to the Wrath of God. (4.) In Article ten, they say, that Man's Condition since the Fall is such, that he has no Power, or free Will, of himself to do good Works acceptable to God, without the Grace of God working with him. (5.) The seventh Article affirms that we are justified by Faith only, and are counted righteous before God, for or through the Merits of Christ only. (6.) The twelfth Article recommends the Practice of good Works, and says they are the Proofs of a true Faith. (7.) This Church teaches us in Article thirteen, that Works done before Justification, or before Grace is given, cannot be pleasant to God, nor doth make us meet to receive Grace, as they spring not from a true and lively Faith. (8.) The fourteenth Article flatly denies the Works of Supererogation, and acknowledges that when we have done all we can possibly do, we are still unprofitable Servants. (9.) The seventeenth Article treats of the Doctrine of Election and Predestination. (10.) The eighteenth Article says, that the Church holds all Persons accursed who shall presume to say that any Man is saved by the Law, or by any Sect, Profession, or Persuasion. (11.) The twenty-second Article denies the *Romish* Doctrine of Purgatory, paying Adoration to Angels and Reliques of Saints. (12.) The twenty-seventh and twenty-eighth Articles acknowledge two Sacraments only, *viz.* Baptism and the Lord's Supper, and say, that after Consecration they are still but Bread and Wine, and both are to be received by the Faithful only, in Commemoration of the Body and Blood of Christ, broken and spilt upon the Cross. (13.) The Church holds Infant Baptism, requires Godfathers and Godmothers, and marks the Child in the Forehead with the Sign of the Cross. (14.) These are the Articles relating to the Tenets of the Church of *England*; the other Articles contain only Rules and Orders concerning its Government and Discipline.

*Of their Manner of Worship.*

1. The Church of *England* worship God, first, by confessing of Sins, then calling upon his Name in Prayer, Praises, and singing of Psalms. The Collects are short Prayers used by the Ministers and People, are allowed to be well suited to almost all Occasions; and the whole Way and Manner of its Worship may be seen in the Book of Common Prayer.

2. As the *Romish* Church call all Heretics who separate from her Communion, so the Church of *England* call all that separate from her Communion *Schismatics*.



3. As the Protestants separate from the Doctrines of the Church of *Rome*, on Account of its Errors and Superstitions, so a certain Set of Men (formerly called *Puritans*) separated from this Church under the pretended Notion that several of its Forms and Ceremonies were unwarrantable, and that their Conscience could not bear them.

4. All other Sects who profess Protestantism in *England*, but are not of the established Church, are called *Dissenters*.

5. The *Dissenters* are divided into many other Sects, viz. *Presbyterians*, *Independents*, *Baptists*, commonly called *Anabaptists*, *Quakers*, *Arians*, *Arminians*, *Antinomians*, *Socinians*, *Mugletonians*, &c. but the most noted or popular of these are the *Presbyterians*, *Independents*, and *Quakers*.

#### I. PRESBYTERIANS.

TYRO. What do you mean by *Presbyterians*?

PHILO. All those Persons who deny Episcopacy, or the Government of the visible Church by Bishops; or those who assert that the Church should be governed by *Elders* or *Presbyters*.

TYRO. In what Manner then do they choose their Ministers?

PHILO. By taking a choice out of several Persons, whom the Elders first examine in Principles and Abilities, and when they have fixed upon a Pastor, Teacher, or Minister, they elect, nominate, or ordain him by Fasting, Prayer, and Imposition of Hands. See Acts, Chap. i. ver. 23. to the End.

TYRO. How do they govern their Church?

PHILO. All common Affairs in every particular Church or Assembly are regulated by their *Minister* and *Elders*. (2.) If there are Things arise which require more Judgment to determine, they then appeal to the Ministers and Elders of other Congregations. (3.) They have yet an higher Appeal than this; and in Case of Differences and Disputes, they call a Court or Synod of the most able among them, who accordingly meet to regulate all Affairs, and adjust every thing to the Satisfaction of inferior Congregations.

TYRO. Very well, Sir; and pray what are their chief Tenets, and Manner of Worship?

PHILO. Their Tenets, concerning God, the Trinity, the Sufferings of Christ, &c. &c. are equally the same as that of the Articles of the Church of *England*; and they baptize Infants by sprinkling, and have Sponsors for them as the Church has, but abominate the Name of Godfather and Godmothers.

TYRO. What is their Manner of Worship?

PHILO. They don't use any Form of Prayer, but their Worship consists in *extempore* Prayer, Preaching, and singing Psalms, but

but some of them frequently finish their Prayer with the Lord's Prayer. These Sects are rather *Arminians* than *Calvinists*.

## 2. INDEPENDENTS.

TYRO. What is meant by *Independents*?

PHILO. The Word itself carries its own Meaning with it. They are a Sect who profess themselves *independent* of all other Churches or Persuasions, of all Councils, Synods, and Jurisdictions, and say every Church or Assembly of Men have a Power lodged in themselves; and therefore deny all Superiority and Subordination.—Their Worship is the same as the Presbyterians, and their Tenets much the same, except it be that they hold a particular Redemption, and are in general rather *Calvinists* than *Arminians*.

## 3. ANABAPTISTS or BAPTISTS.

TYRO. What do you mean by *Anabaptists*?

PHILO. They are such who oppose the Baptism of Infants, say it is unwarrantable, and that none are proper Objects of this first Sacrament but adult Persons, and such as are capable of giving Account of their Faith in Christ Jesus, and believe that it is an Ordinance that he enjoined all his Disciples to follow. They say further, that sprinkling with Water is not Baptism, but an Innovation, contrary to the Rules of Scripture, and that therefore no Person is truly baptized, who is not dipped into, or buried under Water, in the Name of the Father, Son, and Holy Ghost, &c.

TYRO. To dip or plunge into Water is certainly the Method pointed out in Scripture. — But pray, from whence sprang this Sect, what are their Tenets and Manner of Worship?

PHILO. They appeared first in *England* in 1521, and were the Followers of *Nicholas Storck*, *Mark Stubner*, and others, who were Disciples of *Martin Luther*, in the Time of *Henry VIII.* (2.) Their Manner of Worship is also *extempore* Prayer, Praises, Preaching, and singing of Psalms. (3.) Their Government or Discipline is also by Elders, and their Principles are according to the seventeenth Article of the Church of *England*, being very strong Predestinarians.

## 4. QUAKERS.

TYRO. Why are this Sect called *Quakers*?

PHILO. Because at first when they spoke or preached they had violent Shakings and Agitations.

TYRO. Who was their first Teacher, and what are their principal Tenets?

PHILO. Their first Leader was one *George Fox*, in the Year 1650,

1650, who taught that the Light within is more sufficient to guide Men to Heaven than the Holy Scriptures; but they are now greatly reformed, and pay a great Regard to God's Word, but still deny the two Sacraments, and all Manner of Ceremonies. (2.) They refuse to take any Oath before a Magistrate, and therefore are indulged to give their Affirmation as Witnesses. (3.) Their Worship is very abrupt, any Person rising up to pray or preach according as he is moved. (4.) They pray and then preach, or instruct their Congregations in all moral Duties, and speak continually against the Modes, Vanities, and Vices of the Age. (4.) They are very plain and simple in their Dress, and as for Order and Discipline in governing their different Assemblies and Congregations, and for Unity, Harmony, and brotherly Love, they really exceed any Christian Sect of People or Church in the Universe.

*Of the lesser or more private Sects.*

1. *Arians*, or the Followers of *Arius*, who in the Time of *Constantine the Great*, A. C. 315, taught that the Son of God is not equal or consubstantial with the Father, but only the first of all created Beings. His Opinion was condemned as heretical by the Council of *Nice* in A. C. 325. but notwithstanding this, they infected the eastern Churches with their Principles, and though they are not a Church or Sect of themselves, yet they are very numerous to this Day in several Churches, but particularly in that Church, whose Articles teach them quite the contrary.

2. *Arminians*, those who adhere to the Doctrine of *Arminius*, who separated himself from the *Calvinists* in the sixteenth Century, and taught that Predestination is grounded on foreseen Works of Righteousness; that a Man has Power of himself to embrace or reject the Motions of the Holy Spirit; and that he may finally fall from Grace after Justification.

N. B. Though there is no particular Sect or Church in *England* under the Nomination of *Arminians*, yet they are very numerous in all the reformed Churches, except among the Baptists.

3. *Antinomians*, a Sect who reject not only the *Mosaic Law* of Ceremonies, but that assert also that all Manner of good Works, such as Honesty, Charity, Sobriety, Temperance, Chastity, &c. are of no Signification, because good or evil Works neither forward nor hinder a Man in his Salvation; that our Righteousness is already fully complete in the Offering of Christ, and that whoever believes faithfully that the Work of Redemption is already finished, it is sufficient, whatever may be his Life and Conversation. There are several of this Sect in *London*, but the two most noted Teachers among them are *Cud-*

*worth*

worth of Oxford Market, and the famous J. Relly of Coach-Maker's Hall, London.

4. *Socinians*, are such who follow the Doctrine of one *Faustus Socinus*, who taught that Jesus Christ was only mere Man, and had no Existence before the Virgin Mary.

5. *Calvinists*, or *Superlapsarians*, the Followers of the noted Reformer *Calvin*, who taught that Predestination is absolute and unconditional from all Eternity, and that God elected certain Persons before the Foundation of the World to eternal Salvation and Holiness of Life.

6. *Lutherans*, the Followers of *Martin Luther*, the noted Reformer in the Reign of *Henry VIII.* He wrote against Pope *Leo X.* concerning the Abuse of Indulgences; his chief Tenets were a firm Belief in the Trinity, and that we are justified by Faith only in Jesus Christ.

7. *Muggletonians*, the Followers of *Lodewick Muggleton*, a Journeyman Taylor, who with one *Reeves* in the Year 1647, taught the People that God himself left his Glory in Heaven, under the Government of *Moses* and *Elias*, and came down and suffered Death on the Cross. They deny the Trinity, the Immortality of the Soul, and say they have a Power of saving and damning. They frequently assemble together in Fields, and in the Evening both Sexes meet at Alehouses or Places appointed, where, after some Sort of Preachment, the Lights are immediately put out, and by the Actions that follow, it is evident that they don't believe the Soul is immortal. The public Place of their Assembly is in *Old-street Square*, and *Barnaby-street, Southwark.*

TYRO. This is a strange Sect, indeed! — But pray what do you call *Methodists*?

PHILO. It is a Name given to all such Persons whose Way and Method is to preach in the Fields, or at the Head of any Street; but it is a Name more particularly given to Followers of *Mr. Whitefield* and *Wesley*. But you are to note, that there is as much Difference between *Whitfieldites* and *Wesleymites* as between any two Sects, the former believing that Salvation is obtained by Faith alone in Christ Jesus, and that the Love of God to his Elect cannot be broken off: Whereas the other Sect believe a Man is justified by Works and Grace, and that it is possible for a Man to go on in Degrees of Holiness till he arrives at last even to a State of Perfection in this Life. The principal Places of Worship for the *Whitfieldites* are the Tabernacles in *Moorfields* and *Tottingham-Court Road*; and *Mr. Wesley's* principal Place is the *Foundery in Moorfields.*

TYRO. I am obliged to you, Sir; and pray are there any more Sects or Professions worthy our Notice?

PHILO.



PHILO. Not that I know of at present ; for all the others are blended, compounded, or intermixed with those already spoken of, in some respect or other.

TYRO. But you will be pleased just to mention them by Name.

PHILO. I will. (1.) *Cainites*. (2.) *Eutychians*. (3.) *Ebionites*. (4.) *Eunomeans*. (5.) *Fatalists*. (6.) *Gnostics*. (7.) *Libertines*. (8.) *Millenarians*. (9.) *Materialists*. (10.) *Nestorians*. (11.) *Origenists*. (12.) *Pelagians*. (13.) *Solifidians*. (14.) *Sublapsarians*. (15.) *Supralapsarians*. (16.) *Stoics*. (17.) *Anti-Trinitarians*, &c. All or any of which you may see at Leisure.

## S E C T. X.

*Of the heathen Mythology, or a concise Account of the Hieroglyphics of the heathen Deities.*

TYRO. What do you mean by *Mythology*?

PHILO. A general Account of the fabulous History of the Gods of the Heathen.

TYRO. What is the Use of *Mythology*?

PHILO. It furnishes our Minds with many Things necessary to be known, in order that we may understand the Writings of many great Men ; but particularly those Works which are wrote in Rhyme or Blank-verse, in which you will find Similies and Allusions run continually through the Work, and therefore, for Want of being acquainted with *Mythology*, you cannot well understand the Design of such Authors, who draw Illusions from fabulous Histories of this Sort.

TYRO. I know it; therefore I want some Instructions in these Things, and hope you will treat a little upon them.

PHILO. I will ; and here follows

### *An alphabetical Account of the heathen Deities.*

N. B. As I have very little Room for a Subject which requires a Volume, I was obliged to treat upon it in the following Order, which is sufficient to give the Reader some Idea of these Things ; but if he has a Fancy hereafter to read more fully concerning it, let him consult Dr. King, Mr. Watson on the heathen Gods, and the new *Pantheon*.

(1.) *Acheron*, Son of *Titan* and *Terra* ; he furnished the *Titans* with Water when they fought against the Gods, and therefore they turned him into a River of Hell ; but others say *Acheron* always was a River, but afterwards was made or converted into a Sulphureous or stinking Lake.

(2.) *Achilles*, Son of *Piletes* and *Thetes* ; his Mother *Thetes* was so fond of him that she fed him duly with *Ambrosia*, and at Night covered him with celestial Fire, and also dipped him  
into

into the River *Styx*, by which all his Body became invulnerable except just the Heel she held him by. He afterwards was Pupil to the *Centaur Chiron*, who told him he would certainly be killed at the Siege of *Troy*, which was done by *Paris*, who, with a poisonous Arrow, shot him in the Heel, and mortally wounded him.

(3.) *Ætæon*, Son of *Aristæus*, a noted Prince for hunting; but being curious to look at *Diana* while she was bathing herself, she changed him into a Stag, whom his own Dogs pursued and killed.

(4.) *Adonis*, the Son of *Cynaras* King of *Cyprus*, and the Favourite of *Venus*. *Mars* turned himself into a wild Boar, and *Adonis* hunting it too eagerly, it turned and bit him in the Groin and killed him: *Venus* flying to his Succour, ran a Thorn into her Foot, from whence the Blood falling upon a Rose, turned it into a *Carnation*, and his Blood she changed into a Flower, called *Anemone*.

(5.) *Æolus*, Son of *Hippotes*, and God of the Winds in general. See *Boreas*.

(6.) *Æsculapius*, God of Physic. One of the Sons of *Apollo*, by the Nymph *Coronis*. He was killed by *Jupiter*, because *Pluto* complained he did so many Cures, he decreed the Number of the Dead.

(7.) *Amphion*, Son of *Jupiter* and *Antiope*; he was such an excellent Performer on the Lyre, that he even raised the Walls of *Thebes* by Harmony.

(8.) *Amphitrite*, Wife of *Neptune*.

(9.) *Apollo*, God of Light and Music, Son of *Jupiter* and *Latona*; he is represented in various Attitudes, but always accompanied with a Harp or Lyre in his Left hand.

(10.) *Ariadne*, the favourite Wife or Mistress of *Bacchus*, whose Crown is placed among the Constellations.

(11.) *Argus*, was one employed by *Juno*, to wait *Jupiter's* Motions with *Io*. He had an hundred Eyes; two of which only slept, till *Mercury* lulled him to sleep, and cut off his Head: But *Juno*, in Honour of his Services to her, transformed his Eyes into the Tail of a Peacock.

It is common when we find a very discerning, penetrating Man, to say, "He has as many Eyes as *Argus*." Or when we undertake or contrive any Thing by Cunning and great Privacy, we say, by Way of Allusion, "Had he the Eyes of *Argus* he never could see or discover it."

(12.) *Asteria*, Daughter of *Cæus*, who was accounted very modest, yet at last was defiled by *Jupiter* in the Form of an Eagle.

(13.) *Astrea*, the Goddess of Justice and Equity, Daughter of *Jupiter*, by *Themis*: She is represented with her Eyes bound or covered over, having in one Hand a Pair of balanced

Scales, and in the other a Sword, to shew Justice is not biaſſed, but acts of herself impartially. She was moved to Heaven for her Uprightness, and translated into the Constellation, or one of the twelve Signs called *Virgo*, or the Virgin.

(14.) *Atlas*, Son of *Jupiter* and *Clymene*; he was a great Lover of Astronomy and Geography, and therefore is represented bearing the whole Earth or Sphere upon his Shoulders.

(15.) *Augeas* King of *Elis*, who was said to keep 3000 Oxen at a Time in one Stable, but as it had not been cleared for thirty Years, it was very noxious; and therefore he hired *Hercules* to clean it, and promised him the Tenth of the Beasts. *Hercules* performed it by turning the Course of the River *Alpheus*; but *Augeas* would not stand to his Bargain, therefore *Hercules* killed him for his Perfidy.

(16.) *Aurora*, Goddess of Light, and Harbinger of *Titan*, or Messenger of the Sun; she was Daughter of *Hyperion* and *Theia*; she bore *Phaeton* to *Cephalus*: But her greatest Favourite was *Tithonus*; she got him translated to Heaven, and after that into a Grasshopper, which every Year change or cast their Coat or Skin, and then will chirp afresh and become lively. This Goddess is represented too many Ways to speak of here; but in common she is painted or pictured riding in a golden Chariot, drawn by white Horses; upon her Head is the morning Star, and her Attendants are the *Dawn* and *Phæbus*.

(17.) *Bacchus*, God of Mirth and Wine. He was Son of *Jupiter* and *Semele*; he is called by a great many other Names or Appellations, viz. *Dionysius*, *Briſæus*, *Bimater*, *Burgenes*, *Tauriformis*, *Nyctilius*, &c. He is represented in various Shapes, sometimes mounted on a Tiger; by others a very corpulent Youth, naked, with a very ruddy Face, crowned with Ivy and Vine-leaves, with a Thyrsus or Stalk in one Hand, and with the other pouring Wine into an Horn: But in general he is represented striding across a Cask, with Glasses in his Hand, and Mirth and Jollity in his Countenance.

Hence all such as are given too much to the Bottle are called *Bacchanalians*.

(18.) *Bellona*, the Goddess of War, and Wife or Sister to *Mars*. She is represented various Ways, sometimes driving a Chariot with Violence, and sometimes with a lighted Torch or Trumpet in her Hand; her Hair composed of Snakes, and her Garments stained with Blood.

(19.) *Cacus*, Son of *Vulcan*, and a noted Robber, killed by *Hercules*.

(20.) *Cælus*, called sometimes *Uranus*, the Offspring of *Terra* or *Gaia*, and the Father of the Sky or Firmament.

(21.) *Cæculus*, the third Son of *Vulcan*. His Mother conceived

ceived him by Means of a Spark flying into her Lap while she sat by the Fire. He is represented with very small Eyes.

(22.) *Calisto*, Daughter of *Lycaon*, and one of the Nymphs of *Diana*: She was debauched by *Jupiter*, and afterwards translated into the northern Constellation call'd the Bear.

(23.) *Castor* and *Pollux*, two twin Brothers, Sons of *Jupiter* by *Leda*, Wife of *Tyndarus* King of *Sparta*; they were both made a Constellation in Heaven, called *Gemini*. They are represented like two beautiful twin Youths, riding on white Horses, with Stars in their Helmet.

(24.) *Cecrops*, those who took Wager of *Jupiter* to fight against *Titan*, but afterwards would not; therefore were turned into Apes.

(25.) *Cephalus* shot his Wife *Procris* undesignedly, with one of the unerring Arrows, which his beloved *Aurora* had furnished him with.

(26.) *Cerberus*, *Pluto's* Mastiff, called the three-headed Dog of Hell, born of *Typhon* and *Echidna*; he fawned upon all who entered the infernal Regions; but infallibly devoured all who attempted to escape. *Hercules* dragged him from Hell in spite of his Master *Pluto*; but the Monster continually vomitted Fire and Foam of Poison, which, wherever it fell, produced that deadly Herb called *Aconite* or *Wolf's-Bane*.

(27.) *Ceres*, the Goddess of Corn and Plenty; Daughter of *Saturn* and *Rhea*; she is also called *Magna Dea*, or the Great Goddess, also *Aletrix* and *Mammofa*, from her nourishing all Seeds and Plants. She first taught the Art of plowing and sowing. She turned *Abas* into a Neut or Water Lizard. She loved *Jasion* Son of *Jove*; but *Jove*, jealous of him, killed him with a Thunderbolt. She is represented very majestic and fair, yellow Hair, crowned with Poppies, holding in her right Hand Ears of Corn, and sometimes in her left a lighted Torch; and at other Times in a Chariot or Car, drawn by winged Dragons or Lions.

(28.) *Chaos*, according to *Hesiod*, the Father of the Gods; but it is evident this is a Jumble, for which that famous heathen Poet lost great Credit. *Abraham Depenbeke* attempted to paint *Chaos*, but though the Work was performed well, yet there was such a Medley of Light and Darkness, &c. wrong placed, that the whole Design was spoiled, and became ridiculous. See the *Pantheon*, p. 2.

(29.) *Charon*, the Son of *Erebus* and *Nox*. He is called the Ferryman of Hell, because he used to ferry Souls over the Rivers *Acheron* and *Styx*. He is represented as a fat, rough-looking old Man, with a bushy grey Beard, with running Eyes, and clothed with Rags, or very tattered Garments.



(30.) *Cupid*, the God of Love; there are various Opinions of his Pedigree; but it is generally supposed, that he was the Son of *Mars* by *Venus*. He is represented blind, to shew that real Love sees no Faults; and is also armed with a Bow and Quivers, or darting Arrows, to shew the Passion of the Mind through the Channel of the Eye; and with Wings, to shew plainly that nothing is more fleeting than the sudden Passion of Love. He is the favourite Boy of *Venus*, and her constant Attendant in her Amours.

(31.) *Cybele*. See *Vesta*.

(32.) *Cyclops*, Sons of *Neptune* and *Amphitrite*. They were Slaves or Journeymen to *Vulcan*, and used to forge Thunderbolts, &c. They had but one Eye, which was in the Middle of their Forehead.

(33.) *Deianira*, Wife of *Hercules*, and the Cause of his Death. See *Hercules*.

(34.) *Diana*, the Goddess of Chastity, Daughter of *Jupiter* and *Latona*, and Queen of the Woods and Forests. She had also several other Names, as *Luna*, *Delia*, *Hecate*, *Cynthia*, &c. Though *Diana* was so remarkably chaste on Earth, yet when she ascended to the Skies, she had several Amours. She had a Daughter by her Father *Jupiter*, whose Name was *Erfa*, or the *Dew*: *Pan* also defiled her in the Form of a white Ram; but her Favourite was *Endymion*. *Diana* is represented many Ways, because she cuts a shining Figure in History; but she is commonly depicted in a high Stature, her Hair dishevelled, a Bow in her Hand, a Quiver at her Back, a Deer's Skin fastened to her Breast, with a purple Robe turned up to her Knees, and Gold Buckles or Clasps; being always attended with Nymphs in a hunting Dress, with Nets, Hounds, &c. (2.) As *Hecate*, she is represented of excessive Height; her Head covered with hideous Snakes; her Feet sometimes by Serpents; and under this Name and Character she is called Goddess of the infernal Regions. (3.) As *Luna* she is represented with a Cressent on her Head, riding in a Silver Chariot, drawn by white Hinds, and Gold Harness, but sometimes by Mules, and at others by Oxen, because of their Lunar Horns.

(35.) *Diodeme*. See *Hercules*.

(36.) *Elysian Fields*; the fictitious Name of a Place, for the Rest of the Just after their Departure.

(37.) *Epimetheus*, Brother to *Prometheus*, and Husband to *Pandora*, opened the Box of Evils upon Mankind. See *Pandora*.

(38.) *Europa*, Daughter of *Agenor*, by the Nymph *Melia*, seduced by *Jupiter* in the Form of a white Bull; he afterwards translated her into the Constellation *Taurus*.

(39.) *Eurydice*, Wife of *Orpheus*.

(40.) *Eurystheus*, *Hercules's* Task-master. See *Hercules*.

(41.) *Faunus*, Father of the Fauns or Demi-gods, or Goddesses of the Woods.

(42.) *Feronia*, the Goddess of Woods and Orchards.

(43.) *Flora*, called also *Cbloris*, the Goddess of Flowers. *Flora* is generally represented in a close Habit, holding in her Hands the Flowers of Peas and Beans, &c. and the Painters have a great Field of Variety in painting her in several Attitudes, with Variety of Flowers of all Sorts.

(44.) The *Furies*, three infernal Deities, called Goddesses of Horror. Their Names were *Tesiphone*, *Alecto*, and *Megara*. They are represented with Hair, composed of Snakes, Eyes very fierce and inflammable, Chains in one Hand and Whips in the other.

(45.) *Galaxy*, the milky Way. See *Juno*.

(46.) The *Gorgons*, four Sisters, of whom *Medusa* was chief. They are represented with Snakes about their Hair, brazen Hands, golden Wings, and Tusks like wild Boars.

(47.) The *Grææ* were three Sisters of the *Gorgons*; they are represented like old Women; they had but one Eye and one long Tooth common to all, which they used occasionally as each wanted.

(48.) The *Harpyes* are *Aello*, *Celeno*, and *Ocypete*, Daughters of *Oceanus* and *Terra*; they are represented with their Faces like Virgins, Ears like Bears, Bodies like Vultures, human Arms and Feet, but having very long Claws.

(49.) *Harpocrates*, the God of Silence.

(50.) *Hebe*, the Goddess of Youth, Daughter of *Jupiter* and *Juno*; but others say she was conceived by *Juno* after her eating immoderately of Lettuces. She was so beautiful in the Eyes of *Jupiter*, that he made her his Cup-bearer; but at a Feast of the Gods, poor *Hebe*, in waiting, had a Slip with her Foot, and had so indecent a Fall that put all in Confusion, and *Jupiter* dismissed her; but to repair this Loss and Shame, *Jupiter* married her to *Hercules*. She is called the Goddess of all Life and Bloom, from Spring to Autumn; then her Foot slips, the Leaves fall, and *Ganymede* succeeds her, who was the next Cup-bearer to *Jupiter*, and some say was afterwards turned into the Constellation *Aquarius*.

(51.) *Hecate*. See *Diana*, (34.)

(52.) *Helle*, who, riding the golden Ram, fell off into the Sea between *Europe* and *Asia*, from thence it is called the *Hellefpont*.

(53.) *Hercules*, the greatest Demi-god, Son of *Jupiter* and *Alcmena*. *Juno* hated *Hercules*, and caused his Mother to be a full Week in continual Pangs by her Enchantments, in the

Shape of an old Woman ; but *Galanthis* at last ran to *Juno*, and told her of the safe Delivery of *Alcmena*, upon which the Goddess re-assumed her Shape, and fled : *Alcmena* was that Instant easy, but *Galanthis*, for her Tidings, was turned into a Weasel. (2.) *Juno*, not content with this, sent two large Serpents to destroy him in his Cradle ; but *Hercules*, though so young, strangled them both with the Squeeze of his Hands. (3.) His Labours would fill a Volume, therefore it will suffice to tell you, that *Juno* always sought his Ruin by many Stratagems. (4.) She sent the *Nemæan* Lion against him, but he tore the furious Animal in Pieces, and wore his Skin as a Trophy of Victory. (5.) He next destroyed that formidable Serpent or Monster *Hydra* [see *Hydra*]. (6.) He defeated the *Centaurs*, and took the wild Boar alive ; tired *Diana's* Hind ; destroyed the Vultures or Birds of Prey in *Arcadia*. (7.) He bound the furious Bull which *Neptune* sent against *Minos*, King of *Crete*. (8.) He slew the wild Horses that breathed Fire, and devoured human Flesh, which belonged to *Diomedes*, the Tyrant. (8.) He also performed the hard Task of *Augeas*. [See *Augeas*] (9.) He defeated all the *Amazons*, carried their Queen *Hippolita* to *Theseus*, and gave her Belt to his Task-master *Eurystheus*. (10.) He killed *Geryon* King of *Spain*, who had three Bodies, with all his furious Oxen ; his Dragon of seven Heads, his Dog of two Heads, and his watchful Keeper. (11.) He stole the golden Apples at the *Hesperides*, and killed the Dragon with a hundred Heads, that was set to guard them. (12.) *Eurystheus*, thinking to destroy *Hercules*, at last commanded him to go to Hell, and fetch *Pluto's* Mastiff, *Cerberus*, which he performed ; *Eurystheus* was surprized at the Performance, and afterwards ordered *Cerberus* back again. (13.) He released *Theseus*, chained to a Stone on the Banks of *Acheron* ; opened a Passage through the *Alps* ; slew the furious Robber, *Cacus* ; with a Number of other heroic Feats ; and yet he was so captivated by the Love of *Amphalia*, Queen of *Lydia*, as even to spin amongst her Women, and suffer female Chastisement. (14.) His Death was occasioned by his Wife *Deianira*, for the Centaur *Nessus* offering Violence to her, *Hercules* shot him with one of those dreadful Arrows he had dipped in the Blood of *Hydra*, which Arrows poison all Things that they enter : *Deianira*, however, grew jealous of *Hercules* on several Accounts, and at last managed it so as to get him to put on the poisonous Garment of *Nessus*, which he no sooner had done, but he was taken delirious, suffered the most excruciating Tortures, and in Agony ran here and there ; at last came to Mount *Oeta*, where he erected a Pile of Wood, and set it on Fire, threw himself into it, and was consumed. *Lycus*, his Friend, followed him in this unhappy Situation, but *Hercules* threw him into the Ri-

ver *Thermopolis*, and he became a Rock ; he gave his Arrows to *Philoctetes*, who afterwards buried his Remains in the River *Dyra*. (15.) *Hercules* is depicted several Ways, but in general in a standing Attitude, with the Skin of the *Nemean* Lion over his Shoulders, and always resting upon a large Club ; at other Times naked, with his Club.

(54.) *Hermaphroditus*, Son of *Mercury* and *Venus*, who was joined in one Body to *Salmacis*, by her Innovation, from hence sprang the *Hermaphrodites*.

(55.) *Hesperus*, the Son of *Atlas*, transformed into the Morning Star.

(56.) *Hyacinthus*, *Apollo's* beloved Boy, turned into the Flower *Hyacinth*.

(57.) *Hyades*, (called *Pleiades*) the seven Daughters of *Atlas*. They grieved so much for the Death of their Brother *Hyas*, that *Jupiter* changed them into Stars, and they are placed in the Heads of the Constellation *Taurus*, and their Rising and Setting are supposed to be attended with Rain.

(58.) *Hydra*, a Serpent. See *Hercules*.

(59.) *Hymen*, the God of Marriage, and Son of *Bacchus* and *Venus*. He is represented in a very fair Complexion, in a Robe of Saffron-colour, and crowned with the Herb *Amaricus*, or sweet Marjorem.

(60.) *Hyperion*, Son of *Cælus* and *Terra*.

(61.) *Janus*, called also *Biceps* *Bifrons* and *Didymæus*, the God of Months and Years ; he is represented with two Faces, and is generally meant the Sun.

(62.) *Jason*, Son of *Æson*, who fetch'd the golden Fleece from *Colchis*.

(63.) *Iris*, Daughter of *Tbaumas*, and *Juno's* favourite Companion and Messenger ; she is represented with surprising Beauty, with Wings, and riding on a Rainbow.

(64.) *Juno*, Queen of Heaven, and both Wife and Sister of *Jupiter*. She is also called Goddess of Marriage and Child-birth ; and bears too many Names to be inserted here, the chief of which are *Lucina*, *Pronuba*, *Juga*, *Domiduca*, *Unia*, *Cenxia*, &c. She was very proud and jealous, left her Seat in Heaven in a Passion, but *Jupiter*, by the Persuasion of *Citberon*, had a very beautiful Image made, which was called *Platea*, which rode in *Jupiter's* Chariot, and it was reported she was going to be made Queen of Heaven instead of imperious *Juno* ; upon this *Juno* returned, and attacked the new Bride, and tore off all her Ornaments ; but having found the Deceit, she seemed to be pleased with the Contrivance, and lived more content and complaisant with her Husband. *Juno* signifies the Atmosphere. She was given to resent every Trifle, but none felt her Resentment more



more than *Hercules*, though at last he was indebted to her for his Immortality ; for *Pallas* brought him in his Infancy to *Jupiter*, who put him to *Juno's* Breast to suck while she was asleep ; but the Goddess, waking suddenly, the Milk ran from her Breast, and falling suddenly upon the Sky, caused the Galaxy or milky Way, which runs in the Heavens from North to South ; some Drops falling upon the Earth caused the Lillies to become white, which before were yellow.

(65.) *Jupiter*, great King or Master of all the Deities ; Son of *Saturn*, and *Rhea* or *Vesta*. His Exploits cannot be inserted here: It is enough to say, (1.) He first defeated the *Titans*, who warred against his Father *Saturn*, and then afterwards dethroned his Father. (2.) He had several Wives besides *Juno*, viz. *Metis*, whom he devoured when big with Child, and he himself became pregnant with *Minerva*, who sprang out of his Head full grown. (3.) He turned himself into all Manner of Shapes and Forms to betray the Honour and Chastity of the Nymphs and Goddesses. (4.) He deflowered *Calisto* in the Form of the Goddess of Chastity, and then turned her into a Bear, and made her afterwards a Constellation of that Name. (5.) Also his Sister *Juno*, in the Form of a Cuckoo, by whom he had *Hebe*, *Mars*, *Vulcan*, and *Lucina*. (6.) In Form of a white Bull, he carried off *Europa* into *Crete* ; surprized *Asteria* in the Shape of an Eagle ; *Agina* in the Similitude of a lambent Fire ; *Clytoris* in the Form of an Ant ; *Amphytrion* in the Form of her own Husband ; and even *Danae*, though her Father built a Tower of Brass to secure her, he descended in a golden Shower, baffled the Keepers, and took her. (7.) He turned *Lycaon* into a Wolf, for serving up the Flesh of one of his Domestics at Table, while *Jove* was present, and consumed his Palace with Lightning. (8.) He also deluded *Semele*, *Io*, and many others ; but worst of all, (9.) He one Day seized the beautiful Boy *Ganymede*, Son of *Tros*, and made him both his *Catamite* and Cup-bearer. (10.) The Reign of *Jupiter* not being so regular and mild as that of *Saturn's*, it was now called the *Silver*, instead of the *golden Age*. (10.) *Jupiter* is represented various Ways, but in general like a grave, majestic Man, sitting on a Throne, holding Thunder and an Eagle in his right Hand, and Darts or Victory in his left ; at other Times the Eagle is at his Feet.

(66.) *Latona*, Mother of *Apollo*, and his twin Sister *Diana*.

(67.) *Lethe*, a River of Forgetfulness.

(68.) *Lucina*, one of the Names of *Juno*, and *Diana*.

(69.) *Mars*, the God of War. *Juno* bare him alone, as *Jupiter* bare *Minerva*, and in Opposition to her Husband, called him the God of War or Revenge. She appointed *Thero* or Fierce-

Pierceness to nurse him, and sent him afterwards to the barbarous *Scythians* for his Education. (2.) *Mars* is also called *Quirinus* and *Gradivus*. (3.) *Mars* is often represented in a standing Attitude, with Breast-plate and Helmet, a Sword or Weapon in his right Hand, and a Shield in his Left; but in general he is represented with a fiery Aspect, completely armed, drawn by raging Horses, extending his Spear, and in the other Hand grasping a Sword, embued with Blood, having *Discord*, *Glamour*, *Terror*, and *Fear* for his Attendants.

(70.) *Medusa*, ravished by *Neune*, and her Hair turned into Snakes by *Minerva*, and afterwards had her Head cut off by *Perseus*.

(71.) *Mercury*, (called also *Hermes*) the Son of *Jupiter* and *Maia*; he is esteemed as a Demi deity, and called the Messenger of the Gods, or Messenger of Speed. He is said to preside over Eloquence, Sprightliness, and Activity. (2.) It is on this Account that he is called sometimes the Father of Theft and Deceit, being capable of gaining his Design by cunning Tricks and deceitful Speeches. (3.) This he shewed very early; for *Vulcan* being fond of him in his Infancy, one Day dandled the little Brat in his Arms; *Mercury*, in Return for his Love, stole away all his Tools. (4.) He also stole the Cestus of *Venus*, and the Scepter of *Jupiter*, but attempting to Steal his Thunderbolts he burnt his Fingers severely. (5.) After this he stole the Cows of *Admetus*. (6.) But he is in general called the God of Rhetoric, Eloquence and Oratory. He was also famous for his Skill in Music, and first taught the Art of Letters, and therefore was often called to decide Quarrels among the Gods as Arbitrator. (7.) He is represented standing on his right Leg, his left Hand pointing upwards, and in his right Hand a winged *Caduceus*, and Wings upon his Head and his Heels.

(72.) *Midas*, King of *Phrygia*, who gave false Judgment, by praising *Pan*'s pretended Harmony before *Apollo*'s, was rewarded by having Asses Ears placed upon his Head.

(73.) *Minerva*, (called also *Pallas*) the Goddess of War, Wisdom and Sciences. She was born full grown in the Isle of *Rhodes*, by Means of *Jupiter*'s violently striking his own Head, and out she sprang; on which Account she is called *Athena*, because she never sucked the Breast; and by others *Ametrosi*, as having no Mother. She excelled all others in the Art of Spinning, and therefore she turned *Arachne*, the Daughter of *Idmon*, into a Spider, because she challenged her at this Art. *Minerva* is represented various Ways, but more fully in a fine Posture or standing Attitude, a steady, yet smiling Countenance, is completely armed, has a gold Breast-plate, a Spear in her right Hand, and a frightful *Ægis* in her left, with the Head of *Medusa*, accompanied with Snakes. Sometimes she has an Owl and Cock  
at

at her Feet or in her Hand ; the former an Emblem of Wisdom, the latter denotes War.

(74.) *Minos*, one of the Judges of Hell.

(75.) *Momus*, the God of Pleasantry and Humour. He was supposed the Son of *Somnus* and *Nox*. He is called *Jupiter's* Fool or Jester, and was often sent for to make the Gods merry : A Story is related of him as follows : *Neptune*, *Minerva*, and *Vulcan*, one Day challenged each other for their Skill, and left it to *Momus* to decide. *Neptune* made a Bull, but he found Fault with it, because his Horns were not set before his Eyes, that he might push with greater Certainty. *Minerva* made an immoveable House, which he disliked, because it could not be moved in case of bad Neighbours ; and *Vulcan* made a Man which he highly condemned, because he had not a Window in his Breast, to see what was coming upon, or might happen to him.

(76.) *Morpheus*, the God of Sleep and Dreams : He is represented by the Figure of a Boy asleep, with one Arm or Elbow, leaning on a black Marble, (signifying Night) and with a Bundle of Poppies under the other Arm.

(77.) *Muses*, the Daughters of *Jupiter* and *Mnemofyne*. (1.) *Calliope* presided over Rhetoric and vocal Music. (2.) *Clio*, the Muse of History and Narrations. (3.) *Erato*, the Muse of Poetry, and Inventress of Dancing. (4.) *Thalia* presided over Comedy, or whatever was merry. (5.) *Euterpe* over Tragedy. (6.) *Melpomene* over Lyric and Epic Poetry, and Dignity of Style. (7.) *Terpsichore*, called Protectress of Music, Inventress of the Flute, and presided also over Logic. (8.) *Polyhymnia* over Oratory, Poetry, and fine Gesture ; and, (9.) *Urania*, the Muse who presided over all celestial Subjects, as Prayer, Praises, and divine Music.

(78.) *Neiades*, the Nymphs of Brooks and Rivers.

(79.) *Nemesis*, Daughter of *Jupiter* and *Necessity* ; one of the Goddesses of Justice, having a Pair of Scales in one Hand, and a Whip in the other.

(80.) *Neptune*, the most noted Son of *Saturn* and *Ops* or *Vesta*, and the Brother of *Jupiter*. His favourite Wife was *Amphitrite*, who was gained to him by the Intercession of the Dolphin, which *Neptune* afterwards placed among the Stars. (1.) He had two other Wives, *Salacia* from the salt Water, and *Venelia*, the Ebbing and Flowing of the Tides. (3.) He is called God of the Sea or Ocean. (4.) He changed *Theophane* into an Ewe, and himself into a Ram, and begat the golden fleeced Ram. (5.) He is represented with dark Hair ; his Garment a Sea-green, riding in a large Shell, drawn by Sea-horses, with a Trident in his Hand, attended by a long Train of Sea-goddesses, Tritons and Sea-Nymphs.

(81.) *Nereus*, Son of *Oceanus*, and Master of the *Ægean Sea*.

(82.) *Nox*, the most antient of all the Deities. She had a numerous Offspring of Gods and Goddesses. She married *Erebus*, by whom she had *Labour*, *Emulation*, *Deceit*, *Fear*, *Darkness*, *Complaint*, *Misery*, *Partiality*, *Want*, *Care*, *Disappointment*, *Disease*, *War*, *Hunger*, *Want*, &c.

(83.) *Oceanus*, the Son of *Cælus* and *Terra*.

(84.) *Ops*, one of the Names of *Cybele*.

(85.) *Oreades*, Nymphs of the Mountains.

(86.) *Orion*, the Son or Production of *Jupiter*, *Neptune*, and *Mercury*. The Story is as follows. They all took a Tour to *Tanagara*, a City of *Bœotia*, where they were well entertained by the hospitable *Hyricus*, in return for which they desired him to ask what he pleased, and it should be granted. Old *Hyricus* requested he might have a Son in his old Age; accordingly, they bade him bring an Ox-hide, which was done; and after they had all made Urine (or piss'd) in it, they bade him bury it ten Months, and then take it up; which he did, and upon taking it up found a fine Boy, which he named *Urion*, from their Urine; but it being more decent, he was afterwards called *Orion*. He was killed by *Diana* in hunting, and afterwards translated to a Constellation, called *Orion*, which used to be remarkable for producing Rain and Storms, when he rose acronically.

(87.) *Orpheus*, the Son of *Phæbus*, by the Muse *Calliope*. He was so remarkably skilled in the Performance of Music, that he went down to Hell to fetch his beloved Wife *Eurydice*, and he effected his Design, for he so charmed old *Pluto* and *Proserpine* with his Harmony, that they had no Power to hold her. Some say he was tore to Pieces by *Bacchus*, others that he was transformed into a Swan; be this as it will, his Harp was translated to Heaven, and formed a Constellation. He is often represented by a Youth, with Life and Sprightliness, playing on a Lyre or Sistrum, with a tame Lion by him, to shew the Power and Efficacy of Music.

(88.) *Orus*, an *Egyptian* Deity, Son of *Osiris* and *Isis*, and is generally represented standing between them, like a *Cupid* or winged Boy.

(89.) *Osiris*, an *Egyptian* Deity, Brother and Husband to *Isis*, and Brother to *Typhon*.

(90.) *Pales*, the Goddess of Shepherds.

(91.) *Pallas*. See *Minerva*.

(92.) *Pan*, the God of Shepherds and Hunters, because he presided over Flocks and Herds. He is esteemed as an *Egyptian* Deity, and is said to be the Son of *Penelope*. He is represented with a ruddy Countenance, two short Horns on his Head, a long thick Beard, clothed with a spotted Skin, crowned with Pine, having



having a Shepherd's Crook in one Hand, and unequal Reeds or Pipes in the other, with a Nose, Feet, and Tail like a Goat.

(93.) *Paris*, youngest Son to *Priamus* King of *Troy*.

(94.) *Pandora*, the first Woman formed by *Vulcan*. All the Gods and Goddesses presented her with something to add to her Perfection, *Pallas* gave her Wisdom, *Venus* Beauty, *Mercury* Eloquence, *Apollo* Music, *Juno* Riches; but *Jupiter* thought she was not yet a complete Woman, therefore he presented her with an enclosed Box full of *Discord*, *Envy*, *Calumny*, *Diseases*, *Age*, *War*, *Pestilence*, and *Famine*; but her Husband *Epimetheus* open'd it, and let out all these Plagues among Mankind; nothing remained but only *Hope* at the Bottom.

(95.) *Pegasus*, a winged Horse, produced by the Blood which fell from *Medusa's* Head.

(96.) *Perseus*, the Son of *Jupiter* and *Danae*. He was pretty famous for Arts and Literature, and also heroic Actions. He cut off *Medusa's* Head; then he mounted *Pegasus* and delivered *Andromeda*, the Daughter of *Cepheus*, from an horrible Sea-monster, and afterwards he was placed among the Stars.

(97.) *Phæbus*, one of the Names of *Apollo*.

(98.) *Phæton* was the Son of *Apollo*, by the Nymph *Clymene*: He was from his Infancy of an aspiring Disposition, and so remarkably conceited, that he undertook every Thing with a sure Confidence of performing it; and though he had been often reproved for it, yet he could not be dissuaded from every Attempt; but the most remarkable of all is this: He being accused by *Epaphus* for being a Bastard, told his Father *Apollo*, and appeared uneasy at the Reproach: *Apollo*, to appease his fiery and hot Disposition, soothed him, by telling him that whatever he asked of him it should be granted; *Phæton* then requested that he might drive the Chariot of the Sun round the Globe for one Day only: *Apollo*, sorry he had made such a Promise, laboured to convince him of the Danger, and got several others to tell him his Inability of performing it so young as he was, and with such furious and ungovernable Horses: But *Phæton* persisting in his Obstinacy, and *Apollo* not being able to get off from so strict and affirmative a Promise, submitted to the giddy conceited Youth; but no sooner did he mount the Chariot, than he saw the Folly of his Arrogancy and Ambition, for the Horses immediately ran heady and furiously along, nor could he with all his Pride command their Reins, so that they flew here and there at Random, and had like to set the World on Fire, had not *Jupiter* interposed, and with his Thunderbolts struck him headlong into the River *Eridanus*, now called *Po*. His three Sisters, *Phæbe*, *Lampetia*, and *Phaethusa* lamented him so much on the Banks, that they

were

were at last changed into the black Poplar Tree \*.

(99.) *Phlegethon*, one of the sulphurous Rivers of Hell.

(100.) *Pleiades*, the seventh Daughter of *Atlas* by *Pleione*; their Names are *Maia*, *Electra*, *Haylcione*, *Celæno*, *Asterope*, *Taygete*, and *Merope*; *Jove* translated them into a Constellation, commonly called the seven Stars.

(101.) *Pluto*, Son of *Saturn* and *Ops*, and King or Ruler of Hell and all the infernal Regions. He is represented in a Chair, drawn by four black Horses, with a ghostly Wand in one Hand, and sometimes a Sceptre in the other.

(102.) *Pomona*, the Goddess of Orchards and fruit Trees, but particularly of Apples.

(103.) *Prometheus*, the Son of *Iapetus*. He was a great Favourite of *Pallas*; but put such a Trick upon *Jupiter*, that he resented it ever after; and therefore sent *Mercury* and *Vulcan* to seize, and carry him to Mount *Caucasus*, and chain him there to a Rock, and set a Vulture to prey upon his Liver, which *Jupiter* most barbarously renewed every Day in Proportion to what the Vulture devoured: But *Hercules* killed the Vulture and released him.

(104.) *Proserpine*, the Daughter of *Jupiter* and *Ceres*, ravished by *Jupiter*, in Form of a Dragon. She was married to *Pluto*.

(105.) *Proteus*, the Son of *Neptune*, by the Nymph *Phænice*, and Keeper of the Sea-calves. He had Power to turn himself into all Manner of Shapes.

(106.) *Pygmalion* fell in Love with an Image of his own making, and *Venus* changed her into a Woman for him, and he married her.

(107.) *Python*, an enormous Serpent, sent by *Juno* to devour *Latona*, but *Apollo* killed it.

(108.) *Rhadamanthus*, one of the inferior Judges of Hell.

(109.) *Rhea*, one of the Names of *Cybele*.

(110.) *Saturn*, the younger Son of *Cæus* and *Terra*. He was persuaded by his Mother to exclude his elder Brother *Titan*, but on Condition of his reigning in *Titan*'s stead, he engaged to devour all his male Children, that they should not inherit after him; but *Vesta* hid one Boy and preserved him. *Saturn* heard of it, and demanded the Boy, but his Wife, instead of the Child, gave him a Stone, which he greedily swallowed, and she, for the Honour,

\* Of all the Tales in the Heathen Mythology, none is a better Lesson for Youth than that of *Phæton*'s Conceit and Headiness. For hereby they are taught not to assume any thing beyond their little Spheres; but constantly and readily obey their Parents, and be ready to receive and follow all good Advice, lest they come to a sudden and untimely End.

named the Stone *Ab-addir*. (2.) The Reign of *Saturn* was so mild and happy, that it was called the *golden Age*. (3.) *Saturn* is generally represented like an old Man, bare and bald-headed, full of Age and Infirmities; in his right Hand is placed either a Sickle, Scythe or Key, and a Serpent in his Left, or twining in a circular Form, biting his own Tail.

(111.) *Satyrs*, the Attendants of *Bacchus*, who resided in Woods and Forrests; they were very lustful and wanton, and delighted to defile the Nymphs. They had deformed Heads, short Horns, hairy Bodies, crooked Hands, Legs and Feet like Goats, and Tails like Horses.

(112.) *Semele*, Daughter of *Cadmus*, and one of *Jupiter's* Mistresses, who vainly desired the God to embrace her in full Majesty, as he did *Juno*: *Jupiter* with Reluctance granted her Request, and she, for her Folly, was consumed in the Effulgence of his Light, not being able to withstand the dazzling Lustre. This was a designed Trick of *Juno* to destroy her.

(113.) *Silenus*, the God of Drinking. He was Preceptor to *Bacchus*, and is represented or depicted as a short, corpulent old Man, with a red Face, a prominent Forehead, a flat Nose, and large Ears; seated upon an Ass, and yet supporting himself with a long Stick or Staff in one Hand, and in the other a *Cantharus* or Pitcher, whose Handle seems to be worn out by frequent Use.

(114.) *Sisyphus*. Authors differ about him, but it is said that he was a *Trojan* Secretary, and very unfaithful to his Trust: Others say he was a noted Robber. However, all agree that his Punishment was this: He was condemned to roll a great Stone to the Top of a very high Hill, which no sooner came near the Summit, but down it went again. — From hence comes the common Saying, for Persons who are in such constant Toil, Labour, and Slavery, that they, without a View of Ease and Freedom, are like *Sisyphus*.

(115.) *Styx*, one of the Rivers of Hell, noted for being as much too cold as *Pblegethon* is too hot. It is that River which Souls are ferry'd over by old *Charon* into the *Elysian* Fields.

(116.) *Sylvanus*, one of the Gods of the Groves.

(117.) *Sirens*, Daughters of *Achelous*, so noted for their harmonious Voices, that whoever heard them were sure to be decoyed and killed by them. The upper Parts are like a Woman, and their lower Parts like a Fish; and from hence comes the idle Tale of Mermaids, or rather Mermaids, viz. Maids of the Water.

(118.) *Tantalus* entertained the Gods with the Flesh of his own Son, for which he was sent to *Tartarus*, and their afflicted with

with eternal Hunger and Thirst; having both Water and the best Meats and Fruits within his Reach, and yet not able to come at one Bit or one Drop.

(119.) *Tartarus*, Hell, or the dark and dismal Recesses of the infernal Regions, the Place for wicked Souls, surrounded by the flaming Waters of *Phlegethon*, and committed to the Care of the three *Furies*, or avengful Sisters, *Alecto*, *Megara*, and *Tisiphone*.

(120.) *Thamyris*, for challenging the Muses in Music, &c. was struck blind by *Jupiter* and sent to *Tartarus*.

(121.) *Themis*, the Goddess of Laws and Ceremonies.

(122.) *Tereus* ravished *Philomela*, and afterwards was transformed into a *Lapwing*.

(123.) *Terra*, the Mother and Wife of *Calus*.

(124.) *Theophane*, a beautiful Virgin, transformed by *Neptune* into an Ewe, and he, in the Form of a Ram, begat the golden-fleeced Ram of her.

(125.) *Theseus*, Son of *Aegeus*.

(126.) *Thetis*, Mother of *Achillis*; she dipped him in *Styx* to make him invulnerable, and then committed him to the Care of the Centaur *Chiron*, to instruct him in War.

(127.) *Tiresias*, deprived of his Sight by *Minerva*, because he happened to see her bathing in a Fountain.

(128.) *Tisiphone*, one of the *Furies*. Being rejected by *Cythereon*, she killed him by throwing one of her Snakes round his Body.

(129.) *Titans*, monstrous Giants, who sprang from the Blood of *Saturn's* Wound when castrated by his Son *Jupiter*. *Jupiter*, for this Act of unnatural Disobedience, was perpetually harrassed by the *Titans*, who waged War continually with him; and had not *Apollo*, *Juno*, *Mercury*, and several other of the Gods, but particularly *Hercules*, assisted, they had dethroned *Jupiter*; for *Typhon*, the most monstrous of all the Giants, took *Jupiter* Prisoner, forced his own Sickle or Scymeter out of his Hand, and carried him on his Back to *Cilicia*, and bound him in a Cave; but he was rescued, and *Typhon* fled to *Sicily*, where he was covered with a huge Mountain, which ever since vomits Fire, and is supposed to be *Aetna*.

(130.) *Tityus*, Son of *Jupiter* and *Elara*. He attempted the Chastity of *Diana* and *Latona*; and *Apollo* killed him, and sent him to *Tartarus*, where he was chained down flat on his Back, having a Vulture preying on his Liver. It is reported he was of such an enormous Size, as to cover nine Acres of Ground.

(131.) *Triton*, Son of *Neptune* by *Amphitrite*; he used to steal the Catle from the *Tanagrian* Fields, and destroy small



Vessels on the Coasts; but the Inhabitants made him drunk at an Invitation, and then cut off his Head. *Triton* is represented with a large Mouth, bluish Eyes, and short matted Hair, his Shoulders covered with Purple, variegated with Scales: From the Waist upwards he is like a Man; his Feet like a Horse, and his lower Parts like a Dolphin, with a forked Tail, and sometimes drawn in a Car by Horses of a sky Colour, having in his Hand a shell Trumpet.

(132.) *Typhon* or *Tybaus*, the most noted of the *Titans* or *Giants*, said to have an hundred Dragon Heads, Eyes of Fire, and uttering dismal Sounds. See *Titans*.

(133.) *Venus*, the Goddess of Love and Beauty. She sprang from the Fermentation or Froth upon *Saturn's* Castration, which was thrown into the Sea, from whence she also is called *Aphrodite*. She was so exceeding beautiful, that at the Assembly of the Gods, all had a Desire to marry her; however, *Vulcan* at last gave her some Poppies which threw her into a Sleep, and then took Possession of her, but she was even with him, afterwards having Amours with *Apollo*, *Mars*, *Mercury*, and *Neptune*; but her dearest Favourite was *Adonis*. She had many Names, such as *Marina*, from her being born in the Sea; *Melamis*, from her nocturnal Amours; also *Meretrix*, *Genetrix*, &c. She had Temples almost in every Place. She is represented in various Attitudes, but generally clothed with Purple, glittering Gems on her Head, sitting in an Ivory Car, drawn by Swans or Doves; at other Times in a standing Posture, a very smiling and engaging Countenance; attended by Doves, but seldom without her Son *Cupid* by her Side.

(134.) *Vesta* the Elder, called also *Cybele*, the Daughter of *Calus* and *Terra*. As *Vesta*, she is represented sitting, with a Sphere in one Hand, and a lighted Torch in another. As *Cybele*, she is represented in a Phaeton or lofty Chariot, drawn by Lions, crowned with Towers, with a Key in one Hand extended.

(135.) *Vesta* the Younger, the Goddess of Fire, Daughter of *Saturn* by the Elder *Vesta*, and Sister to *Jupiter*, *Pluto*, *Neptune*, *Juno* and *Ceres*.

(136.) *Vulcan*, the God of Fire, Son of *Jupiter* and *Juno*, but others say of *Juno* only; however, it is agreed that he was so deformed, that he was cast out of Heaven upon the Isle *Lemnos*, and in his Fall had his Thigh broke, which rendered him yet more and more ugly. But to repair so great a Loss, he set up a Forge, taught the Art of working in all Manner of Metals. His Journeymen or Assistants were the *Cyclops*, and the principal Works he performed were as follows. He made Thunderbolts for *Jupiter* whenever he wanted. He also made *Neptune's* Trident;

Trident; the invincible Helmet for *Pluto*; a golden Crown for *Bacchus*; a Chariot for the *Sun* and *Mars*; the divine Armour of *Acchillis*; the invincible Armour of *Aeneas*: But to shew his Skill, he made his Mother *Juno* a Chair of Gold, which was so managed by hidden Springs, that when she sat in it they closed her so fast that she could not move till somebody came to her Assistance. (2.) He also has several other Names, viz. *Lemnius*, *Mulcifer*, or *Mulciber*. He was very jealous of *Venus*, and that not without Cause; for *Mars* was one of her chief Gallants; but the *Sun* watched all their Motions. *Mars* perceiving this, set the Boy *Alectryon*, or *Gallus*, to watch all Night, and give him Notice before *Apollo* arose in the Morning; but unluckily for them, their little Watchman fell asleep, and the *Sun* in the Morning saw *Mars* and *Venus* in Amour, and told *Vulcan*, who immediately made him a Net and caught them both in it, and there kept them some time, and exposed them to all the Gods and Goddeses most shamefully. *Mars*, to be revenged on *Alectryon*, turned him into a Cock, who, ever since, gives Notice, by his Crowing, of the Approach of *Apollo*, viz. of the *Sun's* rising. *Vulcan* is generally depicted like a squalid, lame, and deformed Man, working at an Anvil, and attended by the *Cyclops*, his Journey-men.

Thus, *Tyro*, have I given you a concise Account of the Heathen *Mythology*, which, tho' imperfect or deficient, yet will help you very much to understand all poetical and other Authors, who have made, and do make or draw Allusions from this fabulous History.

TYRO. I humbly thank you, kind *Philomathes*. It is prolix enough for me, and better than if it had been much longer.— I suppose I may now bid you an hearty Farewel.

PHILO. That is as you please; but I shall be very ready to give you a little Instruction in one Thing, which is both useful, innocent, and diverting, and more so (in my Opinion) than the last.

TYRO. What is that?

PHILO. It is the Theory of *Music*.

TYRO. Dear Sir, you are obliging indeed: It is the very Thing I wanted.

PHILO. You must be content only with a short Account, and short Instructions.

## S E C T. XI.

### Of MUSIC and VIBRATIONS, &c.

N. B. This little Treatise being already extended beyond its original Design, the Author proposes to treat more particularly upon the Theory of Music only; which will be of as great Service to many that

can already play and sing well, as to those who have at present little or no Knowledge of this Science. For it is to be noted, that a Person may possibly know a great deal of *Music*, who can neither sing nor play; and may also sing and play very well, without being a proper Judge of the Reason of Harmony. This being evident, I shall endeavour to make the following Pages serviceable to the Lovers of Music in general.

TYRO. What is *Music*?

PHILO. *Music*, strictly speaking, signifies only true Harmony of Sounds, and is one of the liberal Sciences, which teaches us the Manner of singing or playing right, according to the Rules of Composition. But, in general, it is used for all Manner of Sounds, whether by Nature or Art; and the Study and Practice of it has ever been counted both useful and diverting, freeing the Mind from every Thing which may press too hard, or dwell too long upon it, and mightily dissipates anxious and melancholy Thoughts, helps to accelerate Business, and if properly and seasonably used, enlivens the whole Man.

TYRO. What is the first necessary Step towards learning *Music*?

PHILO. To get the following Gamut (or the Gamut in Table 1) by Heart.

'The Gamut or Scale of Music. (See Table I. and II.)

G—sol-re-ut	—	in alt.	—	sol	} Treble or Tenor
F—fa-ut	—		—	* { fa	
E—la	—		—	la	
D—la-sol	—		—	sol	
C—sol-fa	—		—	* { fa	} Counter Tenor
B—fa-b-mi	—		—	† Mi or Mee	
A—la-mi-re	—		—	la	
G—sol-re-ut	—	gs: Treble	—	sol	
F—fa ut	—		—	* { fa	} Tenor
E—la-mi	—		—	la	
D—la-sol-re	—		—	sol	
C—sol fa-ut	—	H: Tenor	—	* { fa	
B—fa-b-mi	—		—	† Mi	} Bass
A—la-mi-re	—		—	la	
G—sol-re-ut	—		—	sol	
F—fa-ut	—	G: Bass	—	* { fa	
E—la mi	—		—	la	
D—sol re	—		—	sol	
C—fa-ut	—		—	* { fa	
B—mi	—		—	† Mi	
A—re	—		—	la	
Gamut	—		—	sol	

† Mi is always pronounced like Mee.

\* N, B. The Stars show the Place of the Semitones.

THE GARDEN OF LOVE

Handwritten musical notation on five staves, featuring various notes and rests.

Handwritten lyrics for the first system of the song.

Handwritten lyrics for the second system of the song.

Handwritten lyrics for the third system of the song.

Handwritten musical notation on five staves, featuring various notes and rests.

Handwritten musical notation on five staves, featuring various notes and rests.

Handwritten musical notation on five staves, featuring various notes and rests.

Handwritten musical notation on five staves, featuring various notes and rests.

Handwritten musical notation on five staves, featuring various notes and rests.

Handwritten musical notation on five staves, featuring various notes and rests.

Handwritten lyrics for the final system of the song.



The GAMUT, or Scale of MUSIC.



NB. The Stars shew where the Semi-tones lie

Treble

Tab. II.

A musical staff with a treble clef and a key signature of one sharp (F#). It displays the scale of music from G to G. The notes are G, A, B, C, D, E, F, G. Stars are placed above the B and F notes, indicating semi-tones between A and B, and between E and F.

G A B C D E F G  
Sol la Mi fa sol la fa sol

Tenor

G A B C D E F G  
Sol la Mi fa sol la fa sol

C. Tenor

G A B C D E F G  
Sol la Mi fa sol la fa sol

Bass.

G A B C D E F G  
Sol la Mi fa sol la fa sol

NB. Mi is pronounced soft like Me.


Tab. V. Of the Rests in Music.

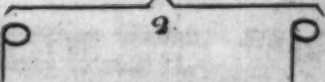
A musical staff with a treble clef and a key signature of one sharp (F#). It displays various rests in music: 4 Bars rest, 2 Bars, Semi-brieve, or 1 Bar, Minum, Crotchet, Quaver, and Semi-quaver.


4 Bars rest 2 Bars Semi-brieve, or 1 Bar


Minum Crotchet Quaver Semi-quaver


# Table III.

1. Semi brieve makes 

2. Minims 

4. Crotchets 

8. Quavers 

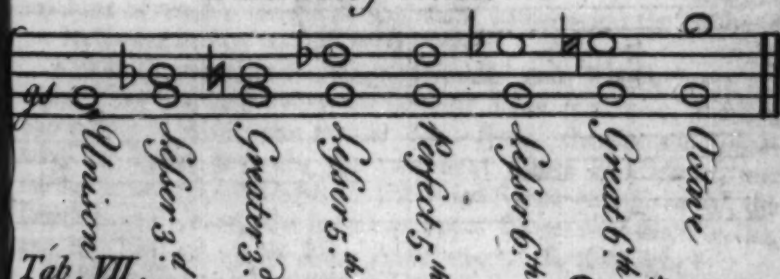
16. Semi-Quavers 

## Table IV.



NB. A prick'd Minum contains 3 Crotchets &c. of the Rest.

## Table VI. Of Concords.

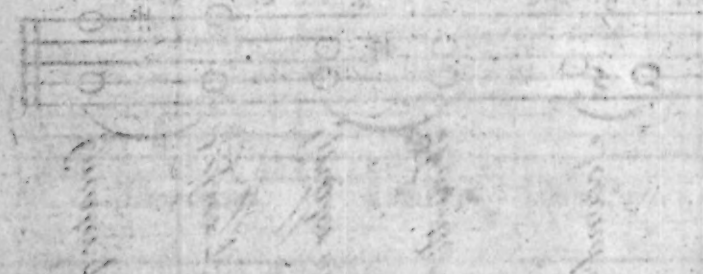
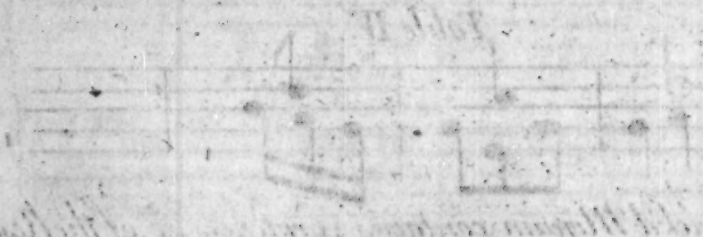


Unison  
Lesser 3.<sup>d</sup>  
Greater 3.<sup>d</sup>  
Lesser 5.<sup>th</sup>  
Perfect 5.<sup>th</sup>  
Lesser 6.<sup>th</sup>  
Greater 6.<sup>th</sup>  
Octave

## Tab. VII.



Second  
Fourth  
Greater or #4.<sup>th</sup>  
Lesser 7.<sup>th</sup>  
Greater 7.<sup>th</sup>



bu  
fla  
or  
you  
lea  
Lin  
ell  
of  
goi  
vizi  
Baf  
way  
whi  
flex  
on  
Nan  
tom  
top  
the  
T  
Baf  
Spac  
way  
thir  
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and  
P  
T  
any  
of th  
Line  
into  
ut;  
five l  
la-m  
re ut  
re-ut

1. Explanation of the foregoing Gamut. See also Plate I.  
Tables I. and II.

TYRO. You say it is necessary to learn the *Gamut* by Heart, but please first to tell me how I am to begin.

PHILO. You may begin at the bottom Line of the Bass as it stands, and learn the Notes from *Gamut* up to *G sol-re-ut* in *alt*; or you may learn the *Bass* first, and then the *Treble*, &c. which you like best.

TYRO. Please to explain a little further what you mean by learning each Part separate.

PHILO. You are to note, *Tyro*, that there are always five Lines ruled on Paper, on purpose to place the Notes upon; or else in the Space-ways between them, according as the Nature of the Tune requires.

TYRO. This I know very well, Sir.

PHILO. Then it can be no hard Task to understand the foregoing *Gamut*. For if you observe, it is divided into three Parts, viz. the *Treble* or *Tenor*, 2. the *Counter Tenor*, and, 3. the *Bass*. Every one of these contain five Lines; and four Space-ways between those Lines; (as appears by the crooked Lines which are placed on the right Hand, and hooks in, or circumflexes each Part separately) now begin with any one of them upon the first or bottom Line of the five, and call the Note by its Name, then go to the first Space-way that lies between the bottom Line and the second Line, and so go on till you come to the top Line of each: thus will you soon know what the Name of the Notes are in any one or all the Parts.

TYRO. I understand you. — Suppose then I begin with the *Bass*. I say the first Note on the first Line is *Gamut*, the first Space-way is *A-re*, the second Line *B-mi*, the second Space-way, or Space between the two next Lines is *C-fa-ut*, the third or middle Line *D-sol-re*, the third Space-way *E-la mi*, the fourth Line *F-fa-ut*, the fourth or upper Space-way *G-sol-re-ut*, and the Top or upper Line *A-la-mi-re*. Is this right?

PHILO. Very right; proceed then.

TYRO. There is no Occasion, I think, *Philomathes*, to say any more upon a Thing so plain; for I perceive the first Line of the *Counter Tenor* begins at, or is counted from the fourth Line of the *Bass*, viz. at *F-fa-ut*, and so goes on till it comes into the second Line of the *Tenor* or *Treble*, viz. to *G-sol-re-ut*; and I also as plainly see, that the *Tenor* or *Treble* have also five Lines and four Space-ways; the first Line of which is *E-la-mi*, the first Space-way is *F-fa-ut*, the second Line *G-sol-re-ut*, and so I go on, Line and Space-way, till I come to *G-sol-re-ut* in *alt*.

PHILO.



PHILO. You are right, *Tyro*; but yet you need not get those *cramp* Words by Heart. There is a much shorter and easier Way, which answers the same End: For, observe, as every eighth Note in *Music* has the same Effect of Sound upon the Ear, by Reason of its being the most perfect Concord to the Eighth below, or above it; so the eight Letters of the Alphabet serve very pertinently to express the eight Notes of Music; and they never go any further than from A to G, and then you begin at A again, and so go on to G, if there be ever so many ascending Notes. But, 2. Because the Learner should not mistake, it is better that he should begin to learn G at first than to come back in the Alphabet to A, (for that is the next Note after G) then B, then C, then D, &c. in all ascending Notes; but if you begin at G and descend to lower Notes, then only count backwards in Order, as those Letters stand in the Alphabet, *viz.* G, F, E, D, C, B, A, and then the next G again, &c. as before. (See Table II.)

TYRO. Sir, I am much obliged to you. This is easy enough; I am sure any Body may soon learn the Name of the eight Notes, if this be all.

PHILO. This is all; and if you look into Table I. you will see that the Notes are the same there as here, only placed in another Order; but every Letter of the Alphabet stands against the Name of the Note by which it is called.

TYRO. I see it plain enough, but what do you mean by this Star (\*) between some of the Notes, both in this *Gamut* and in the Scale, Table I.

PHILO. The Star is placed between those Notes which are but Half a Note or Semitone distant in Sound from each other; and if you observe, there are but two Half-notes or Semitones in the whole *Gamut*; and that is from B to C, and from E to F.

TYRO. Are the Half-notes always between these Letters?

PHILO. No: They are only common to the natural Order of the *Gamut*; but they become variable or shiftable by the Affection of *Flats* or *Sharps*, placed on different Lines or Space ways, which you will see the Reason of, when we come to speak of the various *Keys* in *Music*.

TYRO. I am satisfied; but pray what do you mean by *sol*, *fa*, &c. in the *Gamut*.

PHILO. This and several other Things are better explained by the Table in the Copper-plates annexed, of which we shall speak in their Order.

#### Explanation of TABLE I. PLATE I.

This Table or Scale has eleven Lines like the foregoing *Gamut*, and is in Effect the same as the other, containing Treble, Tenor,

Tenor, and Bass; each of which has five Lines, by running one into another. The first Line of the Bass begins at *Gamut* or G, and ascends ten Notes to B; the first Line of the Tenor, (called sometimes *Counter Tenor*) begins at the fourth Line of the Bass, viz. at F, and ascends also ten Notes till it comes to A, or the second Space way in the *Treble*; and the first Line of the *Treble* begins at E and ascends to G, in alt. — You may see, therefore, very plainly, that from *Gamut* (or G) the first Note of the Bass, to F the first Note of the Tenor, there are seven Notes in the natural Order of the Gamut or Scale itself; and also from F, the first Note of Tenor to E, the first Note of the *Treble*, are contained the same; both of which in *Musick* are commonly expressed a Seventh distant one from another: This plainly shews, that though the first seven Letters in the Alphabet express the first seven Notes in Order so taken, yet to make up the whole Octave or eight Notes, the first Letter which we begin with must be repeated again and included: Thus from A to A, B to B, C to C, &c. both included, make eight Notes or a perfect Octave, as appears more plain by Table II.

#### Of TABLE II. PLATE I.

In this Table, *Tyro*, you have the Names of the Notes of both the other Gamuts distinct in their Order and Parts, with the Names of the Notes under each, beginning at G, &c. so that any one may learn the eight Notes in any one of the Parts, in a very short Time.

TYRO. It is very plain indeed; but what do you mean by *sol, fa*, as I observed before?

PHILO. There is really no Occasion for the Rules of *sol-fa* or *sol-faing* (as it is commonly called) to understand the Notes or to learn to sing, because the whole Art of Singing depends upon knowing where the different Semitones lie in every Key, and that may be done with much more ease than *Sol-faing*.

TYRO. I thought it was universally approved of, in the Practice of Vocal Music, especially in Psalm-tunes and Church-music.

PHILO. No doubt but it may be of some Use in Psalmody, especially to all such as have no Master to teach them any other Method: But don't you know that it is a Maxim, and a self-evident Principle, in Arithmetic and the Mathematics, that that Rule or Axiom which will not always hold good, is no Rule or Axiom at all.

TYRO. But why does not the Rules of *sol-faing* hold good, as it shews the Place of the Semitones in any Key, according to Table II. and V.

PHILO. I grant that from [Mi to fa] and from [la to fa] are

are only Semitones; but you see how shiftable Mi is, and therefore, as this mechanical Sound governs the Place of all the rest, it is straining the Memory of Persons in general; and you shall find very few of what we call the tip-top Church-Singers, who are able at Sight to sol fa a Tune in above two or three of the most common Keys, though they have laboured hard for Years; others even who know the Tune before-hand are not able to sol-fa it in other different Keys; which arises, as I said, from the perpetual changing of Mi, from one Line or Space-way to another: But even *this* is not all; there is a worse Objection still.

TYRO. What is that?

PHILO. I told you before, that *that* is not worthy to be call'd a Rule that cannot always be put in Practice without a Contradiction to itself: Now, I grant a Person may sol-fa a Psalm-tune set in *Minims*, or perhaps being perfect, may, in very slow Movements, sol-fa Crotchets. But how is he to sol fa a Division or *Run* (as it is commonly call'd) in Quavers; and how much less then, will he be able to express those articulate Words of sol-la-mi-fa, when there happens to be a Run of Semi-quavers? Now, though he may sing the *Minims* right by this Rule, yet, if he cannot perform the whole by the same Rule, it is evident that he must either perform it some other Way, or else leave it imperfect.—Besides this, you will find, that the Practitioners of Psalmody in general, will allow that there requires a great deal of Time to sol-fa Tunes in the various Keys common to Psalmody: Now, it is worthy Notice to observe, that if it be difficult and burthensome to the Memory to sol-fa in the most easy Keys, (which are common to Psalm-tunes) how much more burthensome to the Memory must it be to do it in all the various Keys of Music.

TYRO. It is very true what you say, Sir; but though this Rule cannot be well put in Practice with Quavers and Semi-quavers, yet I suppose you will grant it is very practicable and certain in slow Movements.

PHILO. Practicable in a great Measure it may be, but I will not say certain, were it for this Reason only; that it is possible a Person may sol-fa ten Tunes right, one after the other, by calling every one of the Notes according to the Order of the Words, and yet not sing the Tunes right, because he may as well sound a whole Note from mi to fa, or from la to fa, as he may from sol to la; nay, I assure you, I have often heard it done, and therefore, I only mention it that I would not have the Learner think that 'tis impossible to sing a Tune wrong, because he names or pronounces sol-la-mi-fa right by Name, and especially when the Notes lie cramp and at a Distance from each other.

TYRO.

TYRO. If this be the Case then, what Method is the Learner to take to come to a greater Certainty?

PHILO. There can be no better Way than by observing the exact Places of all the Flats and Sharps in the various Keys, which soon may be done, and there are many other Words or Syllables to be found, which are much more practical in singing than sol-fa; but more of this by and by.

TYRO. Well, for my own Part, I know nothing of Music, and only speak what I have heard others say concerning sol-fa; however, I know the Names of all the Notes in every Line and Space-way, and should like to know more if you would take the Trouble to instruct me.

PHILO. That I will, with all my Heart; and as you say you know the Names of the Notes A B C D E F and G in every Line and Space-way, the next Thing you must understand is,

### Of TABLE III. PLATE I.

*Of the dividing of Notes in Time according to their Names.*

This Table contains five Sorts of Notes by Name, and is equal every Way, as appears at Sight. The first Note is called a *Semibrieve* (that is, Half a Brieve, a Note now seldom used) which contains two Minums, one Minum contains two Crotchets, one Crotchet two Quavers, one Quaver contains two Simiquavers, so that the Table is equal every Way, one Semibrieve containing 2 Minums or 4 Crotchets, or 8 Quavers, or 16 Semiquavers; that is, sixteen Semiquavers, eight Quavers, &c. are played to the Time of one Semibrieve.

TYRO. I understand you well.

### Of TABLE IV. PLATE I.

PHILO. A Dot made after a Note makes it Half as long again in Time as it was before, and is commonly called a *prick'd Note*. Thus, a *prick'd* or *dotted* Minum makes or contains three Crotchets; a *prick'd* Crotchet makes three Quavers, and a *prick'd* Quaver makes three Simiquavers, &c.

### TABLE V. PLATE I.

TYRO. What is the Use of this Table?

PHILO. This shews you the different Rests or Pauses in Music; the two first broad Strokes drawn from, or extended through two Space-ways, or three Lines, stand for eight Bars Rest, and wherever this Mark is found, either in *vocal* or *instrumental* Music, it signifies that Part is to rest or stop eight full Bars. The next broad Stroke only extends to two Lines or one Space-way, and signifies two Bars Rest, or a Pause in that Part resting



ing two Bars, and so on with the rest, which the Table itself sufficiently explains.

TYRO. It is plain and easy enough to be understood.

TABLE VI. and VII. PLATE I.

TYRO. I see these two Tables shew the Concords and Discords; but what Use am I to make of this?

PHILO. As you have done, or ought to do with all other; to get them so by Heart as to know the Nature of Concords and Discords in general, what Notes are such by Comparison, and what are really not of either Sort.

TYRO. But how can I be a Judge in this Respect?

PHILO. That is a Question I cannot resolve at present: It must be the Effect of Time and Observation to make you Master of this; but still it is proper you should know beforehand what are real Concords of themselves, and what are Discords to those Concords.

TYRO. I suppose you now speak of Music in two or more Parts.

PHILO. Most certainly I do; for there can be no Discords in any single Part of Composition, because every Air or Tune is absolute; but when another Part is added, that is, when there are other compound Notes to be played with the first Part, or any two Parts or Sounds to be played or sung together, then the proper Concords or Discords will evidently appear, and even a good Ear (though no great Judge) will easily discover the Difference, and whether the Discords are out of their proper Place.

TYRO. Why, then, I perceive you allow of Discords sometimes.

PHILO. No doubt of it: It would be a very heavy Piece of Composition that had not this Mixture; but then the Difficulty lies to know where they are to be properly introduced, to make the Harmony yet more complete and agreeable; but this I shall endeavour to explain by and by, if I have Room: however, for the present, you may observe thus much, that the *fourth* reckoned from any Key-note downwards, becomes an Accompaniment to the *sixth* from the same Note; and the *sixth* from the upper Note or Key-note above it, will become only a *third* from the *eight* below the original Key-note: Therefore, if you begin below upon the Octave Key-note and ascend, the same Notes will now become third, fifth, and eighth; which before, in descending, were fourth, sixth, and eight to the Key-note above them: In this Case, a fourth becomes a proper Concord, because it is a perfect fifth from the Octave below.

TYRO. I don't quite apprehend you; pray give me an Example.

PHILO.

PHILO. Suppose then I begin at A, and want to make all the proper Chords downward to A, I say that E, C and A will be a fourth, sixth and eighth to the A above them; but if I begin at A below, and want the proper Chords or Concords to it upward, I then find that C, E and A will be a third, fifth, and eighth, which are the very same Notes as before, only differently named: This will appear evidently to any one who knows the least of Music, or is acquainted ever so little with the Nature of the Keys or Notes of any Organ or Harpsichord, &c.

TYRO. I do not quite apprehend you at present.

PHILO. But you will easily perceive it, if you do but consider well what I have told you, and mind what is laid down in the next Table, where the Keys of the Instrument and their correspondent Notes conspicuously appear to every diligent Reader.

TABLE VIII. (PLATE II.) Fig. 1.

*Of the Diatonic Scale, shewing the Reason of the natural Production of the various Tones and Semitones, from the Laws of Proportion and Vibration.*

TYRO. Though I understand the Notes very well, yet I confess I know nothing of this Table, nor what you mean by Proportion of Sounds at present.

PHILO. May be so; but you will soon understand it if you give but the least Attention to the Explanation. Observe then, and look on the Figure while you read.—1. Let S C S represent a Scale divided into 100 equal Parts, and let any Note in the Gamut or Scale be drawn up to any Tone or Pitch at Pleasure.—But that the Definition may appear more clear, we will take the natural eight Notes, or the Notes of the natural Key, beginning at C, with the proper Semitones till you come to its Octave C, or an eighth higher; which Octave contains thirteen different Sounds, or twelve Semitones included.

2. Let then the Line C C C be equal to the Key or first Note C, and also equal to the Scale itself, S C S of 100 Parts; then the Length of any other Note will very easily be found as follows, viz.

3. As the Denominator of any Note is to its Numerator, so will the original Scale or Denominator 100 be to the Length of the String of any Note required.

4. Now in the Scale of Chords and Discords, there is a Comparison made of the Octave, double Octave, treble Octave, &c. which when understood, the fractional Parts or Intervals of the Diatonic Semitones, throughout the whole Scale, are found by the Rule of Proportion only. For,

5. Though twice 8 is 16, and 3 times 8 is 24, 4 times 8, 32, &c. in common Multiplication, yet it is not so in the Doctrine

of Sounds; for in Music 2 8ths or 2 Octaves make but 15; 3 Octaves make but 22; and 4 Octaves but 29 whole Notes: the Reason is evident, because the last Note of every Octave is always counted the first Note of the next Octave.

6. This being considered, we must now see the necessary Fractions in the Intervals of the Octave; and as every whole Note contains 2 Semitones, it will follow that there must be 12 Semitones in the natural 8 Notes, because there are 2 half Notes included, *viz.* from E to F, and from B to C natural, as appears from Plate I. Table I.

7. Now it is evident that these 12 different Semitones must have a Proportion of Sound between the first original Note C, and its Octave C, and every one of them must be a fractional Part of the Octave, or double Octave: Thus the greater or sharp 7th would be  $\frac{7}{8}$ , but is more properly called  $\frac{15}{16}$  to avoid Fractions in the different Numerators. Let us then,

8. Suppose the first Note C equal to the Scale of 100, then the Fraction will be  $\frac{100}{100} = 1$  equal to Unity itself, or the first original Tone from whence the rest must be calculated: Therefore every next ascending Semitone must be more acute, and of consequence a Part of the whole Scale.

9. The Fractions then for all the Sounds in the *Diatonic Scale* will stand thus in Order,  $\frac{1}{2}, \frac{15}{16}, \frac{8}{9}, \frac{5}{6}, \frac{4}{3}, \frac{3}{2}, \frac{5}{7}, \frac{2}{3}, \frac{5}{8}, \frac{3}{4}, \frac{5}{9}, \frac{8}{15}$ , and  $\frac{1}{2}$ . To find the Length of the String or Chord in Proportion, observe,

10. As the Denominator of every or any of the Fractions, is to its respective Numerator, so is the whole Scale of 100 Parts to the Length of the Chord or String belonging to it. For Example; I would know the Length of the Strings which shall properly vibrate to bring out the Tones of  $\frac{8}{9}$  and  $\frac{4}{3}$ , with the correspondent Notes belonging thereto. I only say, as 9:8::100:88.8 88.8. equal Parts out of the Scale of 100, which in the Table answers to the Note D, or whole Tone from C. Again, as 5:4::100:80, which answers to the Note E, being the greater Third from C. And thus may any Note or Tone, half Note, or Semitone, be found, either the Length productive of such a Tone or Note, or the Note requiring such a Length.

11. Hence then it appears, that all Notes which vibrate  $\frac{1}{2}$  are Unisons, and all which vibrate  $\frac{1}{4}$ , or as 2 to 1, are Octaves; and that all such which vibrate any otherwise, are certain Notes, having a Comparison between  $\frac{1}{4}$  and  $\frac{1}{2}$ .

12. Therefore, suppose it were required to find a true harmonical Mean between Unison and Octave; add the Numerators and Denominators together, you have  $\frac{2}{3}$ , which in the Table answers to G, the perfect 5th from C, or perfect 4th from its Octave C.

13. Again, to find the greater *Third*. Thus  $\frac{1}{1} \times \frac{2}{3} = \frac{2}{3} \times \frac{2}{1} = \frac{4}{3}$ . Now  $\frac{4}{3} \div \frac{1}{1} + \frac{2}{3} = \frac{12}{3} = \frac{4}{3}$  or 80 Parts, which answers in the Scale to the greater *Third*, &c.

14. Thus may any harmonical Mean be found between any two extreme Notes: For let  $x$  and  $e$  represent two Extremes, and let it be required to find  $m$  the Mean; it is evident to any Person that understands the least of *Algebra*, or the true Order of the Laws of Proportion, that the Mean will be  $m = \frac{2xe}{e+x}$ . Thus, for Example, multiply the Extremes by 2, and divide the Product by the Sum of the Extremes, and you will have the harmonical Mean.

Thus between Unison and Octave.

First,  $2 \times 1 = 2 \times 2 = 4$ ; this  $\div 2 + 1 = 1\frac{2}{3}$  the harmonical Mean; that is,  $2.1\frac{2}{3}$  and 1, are the three Terms, which being multiplied by the Denominator of the Mean Fraction, will produce 6.4. and 3, whose Ratios are 3 : 2 and 4 : 3; the first of which answers to the 5th, and the other to the 4th in the Diatonic Scale.

15. But in order to find all the real Chords, there need only be drawn a simple Line, which being divided into 4 Parts only, will discover the Length of the Unison, Octave, and all the intermediate Chords; and nothing can be wanting but common Apprehension to understand it.

*A further Explanation of the Diatonic Scale, Plate II. Fig. 2.*

Let the Line A B represent a Scale of 100 equal Parts, the same as the Diatonic Scale itself. Let A B be divided into 2 equal Parts in C; then divide CB into 2 equal Parts in D; and also divide C D into 2 equal Parts in E; then you will have the following Proportions.

1	As	AB : AC :: 2 : 1	the Octave
2		AD : AC :: 3 : 2	the perfect 5th
3		AB : AD :: 4 : 3	the perfect 4th
4		AE : AC :: 5 : 4	the greater 3d
5		AE : AE :: 6 : 5	the lesser 3d
6		AE : EB :: 5 : 3	the greater 6th
7		AB : AE :: 8 : 5	the lesser 6th

N. B. The Discords 2d, or 9th; Sharp 4th, Natural 7th, or Sharp 7th, may be found by the same Comparison or Proportion: Do you understand me, *Tyro*, or not?

TYRO. I will not say I am quite Master of what you say; but I will take Care to look over it again very attentively: And therefore if you have any Thing further to add, I beg you would proceed to instruct me.

PHILO. The next Thing then, *Tyro*, is to understand the Nature



ture of the various Keys in *Music*, for upon this, and keeping good Time, depends the whole practical Part.

2. *Of the different Keys, Plate II. Fig. 3.*

TYRO. What do you mean by the Keys in *Music*?

PHILO. The Key-note, which gives Motion to all the rest, and in the Bass always ends in the Key, or on the Key-note itself.

TYRO. How many Keys are there in the natural Order of the *Gamut*?

PHILO. Strictly speaking there are no more than *two*, viz. C natural, the sharp Key; and A natural, the flat Key; all other Keys besides being only *artificial*, viz. made by the different Disposition of Flats and Sharps, on the different Lines and Space-ways.

TYRO. What do you mean by a *flat* and a *sharp* Key; and why is C call'd a *sharp* Key, and A a *flat* Key?

PHILO. On account of the greater or lesser Third from the Key-note itself; for a *sharp* Key has the greater 3d, or 2 whole Tones or Notes from the Key Note; but the flat Key has the lesser 3d, which contain only *one* whole Tone and a Semi-tone, which is deficient or less than the sharp Key by *one* Semi-tone.

TYRO. I own I never knew this before, for I have heard others say, and always thought so myself, that *that* was a sharp Key when *Sharps* were set at the Beginning, and a *flat* Key when it had *Flats*.

PHILO. But I hope you see the contrary now. Do you not?

TYRO. Very plainly, and I perceive also very plainly, that every Key after C, and every Key after A, is only the same 2 Keys moved one Line and one Space-way higher at Pleasure, with such proper Flats and Sharps to make them have the same Third; and I suppose this is what is called *Transposition*; is it not?

PHILO. Yes, and nothing is easier: for suppose I found a Tune in C $\sharp$ , and wanted to set it 5 Notes higher or 4 Notes lower, which is the same; then I find it must be set in G or Gamut Sharp, having a Sharp on F only, as the Table plainly shews; if I want it 6 Notes higher, or a Third lower, which is A, then I find 3 Sharps are necessary, viz. 1 on G, 1 on F, and 1 on C; if I want the Tune a greater 3d higher, viz. in E, I find 4 Sharps are necessary, viz. 1 on G, 1 on F, 1 on D, and 1 on C; but if I want it a lesser 3d higher, viz. in E flat, then I find 3 Flats necessary, viz. 1 on E, 1 on B, and 1 on A, which is still a sharp Key as before, because from E flat to G natural is greater 3d, the same as from E natural to G sharp, or from C natural

natural to E natural. The same is to be observed in transposing from flat Key to flat Key, due Regard being had also to move all additional Flats and Sharps, as many Notes higher or lower as you transpose to; — but Practice and Observation are the chief Things.

TYRO. I understand you, Sir; and have you any Thing further to say concerning the Keys?

PHILO. Only this, that all artificial Keys ending on the natural Keys of a Harpsichord, or the natural Letter itself, are, for Distinction sake, called *perfect artificial* Keys; those which end on the half Notes, or between any 2 natural Notes, are called *imperfect artificial* Keys, and such are those which have the Stars over them in the Plate?

TYRO. You have sufficiently defined what I wanted concerning the Knowledge of flat and sharp Keys: But pray are these all the Keys?

PHILO. These are the Names of those that are constantly used both in *vocal* and *instrumental* Music. — Some indeed have said there are 96, others 72 Keys: however, it is evident there are 48; *viz.* 24 *flat*, and 24 *sharp* Keys; but as there is no Use for more than I have inserted, I omit the others, being useless.

TYRO. I am obliged to you, Sir; and pray what is the next more necessary Thing in the Practice of Music?

PHILO. One more so necessary, that without it all the Performance, though ever so right in respect of Flats and Sharps, would be but constant Clashing and Confusion.

TYRO. What can this be then?

PHILO. It is the keeping of *good* or *true* Time.

### 3. Of Time.

TYRO. What do you mean by *Time* in Music?

PHILO. That perfect Regulation by which every preceding Bar (from Bar to Bar) throughout any Piece of Music, is performed exactly in the same Space of Time as the preceding Bar, or Bar before.

TYRO. I suppose you call the Bars those perpendicular Strokes drawn cross the 5 Lines; and if I apprehend you, you mean that if one Bar has but 2 or 3 Notes, and the next 6, 8, 10, &c. the Bars must still be performed in the same Time; because they are equal, according to Plate I. Fig. 4.

PHILO. Your Notion is very just.

TYRO. How many Sorts of Time are there?

PHILO. Strictly speaking but two, *viz.* *Binary* or common Time, and *Trenary* or *Triple* time.

TYRO. Why are they so called?

PHILO. 1. *Binary* signifies to *rise* and *fall* equal, or to divide every Bar in Music into 2 equal Parts, beating with the Hand

or Foot Half the Quantity down and Half up, or by the Pendulum of a Clock, &c. 2. *Trenary* Time is divided as 2 to 3; that is, into 3 equal Parts, 2 Parts of which are played or sung with the Foot down, and other Part with the Foot or Hand up.

TYRO. By what am I to know or distinguish common Time, and the Measure?

PHILO. By observing what follows.

*Of common Time. See Plate II. Fig. 4.*

TYRO. What are the Marks, Signatures, or Characters of common Time?

PHILO. They are certain Characters set before the Tune, by which the Movement is duly regulated.

TYRO. I perceive then there are 4 Sorts of common Time; pray explain them.

PHILO. The first of these Characters of itself signifies the slowest of all the Movements, and has 4 Crotchets in every Bar, (or Notes equal to them) and is generally placed at the Beginning of all *Adagio's*, *Largo's*, or very slow Parts. The 2d Character is the most common in vocal and instrumental Music in general; it has also 4 Crotchets in a Bar, and its Movement is half as fast again as the former. The 3d and 4th Characters denote a very quick Movement, and are generally set before Pieces of Music or Tunes, called *Gavots*; and the only Difference between them is, the first has in general 4 Crotchets in a Bar, but the other never but 2 in a Bar, and is sometimes called *re-tortive* Time.

TYRO. I am obliged to you, Sir; and now pray what are the Characters belonging to *Trenary Measure*, or *Tripla time*? See Plate II. Fig. 4.

PHILO. There are 9 Characters, or rather fractional Figures, *viz.* first,  $\frac{3}{2}$ , which signifies 3 Minims in a Bar;  $\frac{3}{4}$ , which has 3 Crotchets in a Bar;  $\frac{3}{8}$ , which contains 3 Quavers in a Bar; these are beat or measured 2 Parts of the Bar down and one Part up; secondly,  $\frac{6}{4}$ , which has 6 Crotchets in a Bar, and beat like common Time, 3 down and 3 up; that is, Half the Bar down and Half up;  $\frac{6}{8}$ , signifies 6 Quavers in a Bar, 3 down and 3 up;  $\frac{9}{4}$ , shews there are 9 Crotchets in a Bar, 6 down and 3 up;  $\frac{9}{8}$ , is 9 Quavers in a Bar, 6 down and 3 up;  $\frac{12}{4}$ , signifies 12 Crotchets in a Bar, 6 down and 6 up; and  $\frac{12}{8}$ , signifies 12 Quavers in a Bar, 6 down and 6 up. Do you understand me?

TYRO. Yes, very well; but how am I to know whether I play or sing Time too fast or too slow?

PHILO. Good Time or true Measure is not determined by one Person's singing or playing faster than another. Masters of vocal



# THE DIATONIC SCALE.

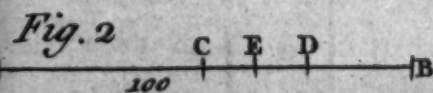
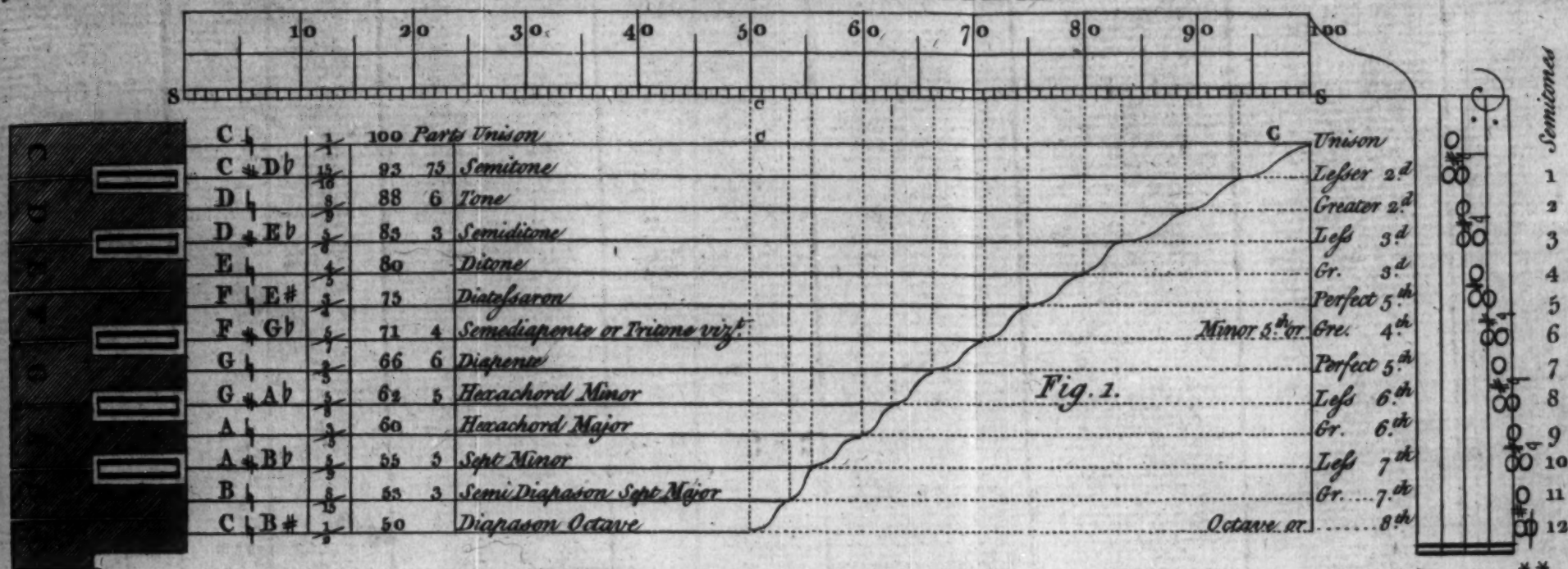
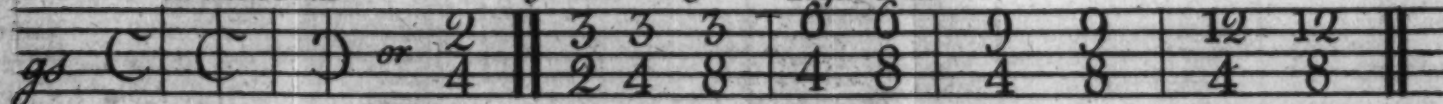


Fig. 3.



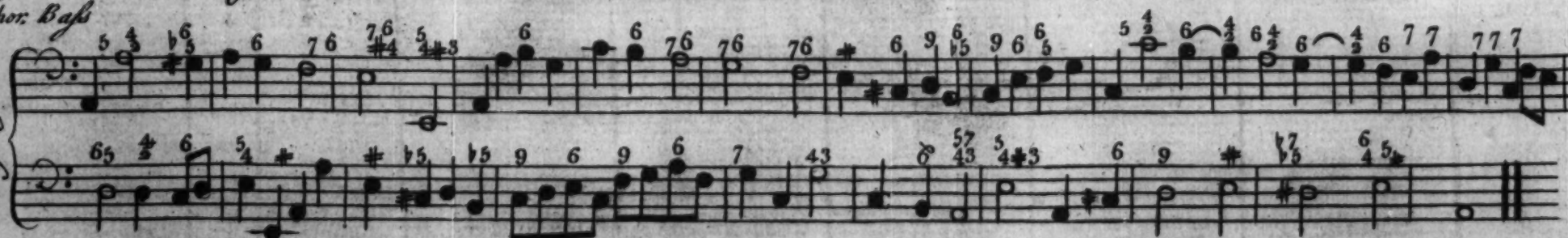
Common Time

Of Time Fig. 4. Triple Time



Thos. Bass

Fig. 5.





cal or instrumental Music often sing and play the same thing faster or slower than one another; nay, even themselves singly will do so at different Times of performing.

TYRO. If so, how am I ever to judge of their Time?

PHILO. Not by their performing faster or slower at one Time than another; but by their performing every Bar throughout in the same Space of Time; if this is done, the Performer is a good Timeist: For it is not to be supposed, that any one would pretend to sing or play Minums or Crotchets (in the same common Time) as fast as possible; nor would they be so foolish to play a quick Movement (such as Jiggs and Minuets set in Quavers) as slow as a Psalm tune.

TYRO. I understand you very well, Sir; and if you have Time and Room, I would beg Leave to intreat you, to tell me something concerning a *thorough Bass*; for I never could conceive the Reason of the Figures standing over the Bass.

PHILO. To understand a *thorough Bass* well requires Practice, but when it is understood, it discovers the Beauty and Harmony of all the Parts, and in short is the Foundation of Composition itself, as you may see by what follows.

#### 4. Of a *thorough Bass*.

TYRO. What do you mean by a *thorough Bass*?

PHILO. Sometimes it is taken for a continual Bass running through the whole Piece without any Bars resting or pausing; but more strictly it signifies *that* Bass in Music which has Figures set over or under the Notes. The Notes themselves are played with the left Hand upon the Harpsichord or any key'd Instrument, and the Figures over the Notes are played with the right Hand to fill up the other Parts of the Composition.

TYRO. Can you give me some short Rules whereby I may gain a little Knowledge of this Art.

PHILO. I can, but short they will be; but it is to be observed, that before you can understand them well, you must be well acquainted with the Nature of Flats and Sharps, and the various Notes in the different Keys.

#### *Short Rules for a thorough Bass.*

Rule 1. When you are playing a *thorough Bass*, and there are no Figures set over the Bass-note or Notes, then it signifies that you are to play the perfect or common Cords to such Notes, *viz.* the 3d, 5th, and 8th.

Rule 2. The Foundation of the true Knowledge of a *thorough Bass* very much depends upon knowing what Cords and Discords depend upon all the Intervals of 8 Notes in either of the  
natural

natural Keys. Thus, suppose I pitch upon C natural in the Bass, and discern'd 8 Notes in Order of the Gamut; I say, the Key-note itself will have 3d, 5th, and 8th; that is, E, G and C, will be the common Cords to it.

Rule 3. If I begin at C and find a common Cord to it, is 3d, 5th and 8th; then if I ascend one Note higher in the Bass to D, the former Cords 3d, 5th and 8th to C, will now become 7th, 4th, and 2d to D; also 6th, 3d and 8th to E; 7th, 5th and 2d to F; 6th, 4th and 8th to G; 7th, 3d and 5th to A; and 6th, 4th and 2d to B.

Rule 4. The Accompanyments of the Figures that are Discords, such as the 2d; then observe, if the Treble or leading Part be a Minum, and the Bass contains 2 Crotchets, the first of which is a common Cord, and the next descends one Note; then the same Cord is continued with the right Hand while the Bass descends, and will become 2d, 4th and 6th to the same Note; — But if the Bass lies still, *viz.* has the same Note continued by a Hold or Circumflex from Bar to Bar, and the Minum, or 2d Minum, has a Figure of 2 set over it, or by the Side, then you must accompany that 2d with a perfect 4th, or a sharp 4th, according to the Key you are playing in; but in this Case the 4th ought to be set down with the 2d, which is often neglected, to the great Hurt of Learners.

Rule 5. If you see a 4 and a 6, over any Note, count only 4 Notes, and 6 Notes from the Bass Note itself, according to the Order of the Key, and put the 8th to them for an Accompaniment.

Rule 6. When you find 6 and 4, and 5 and 3 over one Note of the Bass, then play 6, 4 and 8, the Half of that Note, and 3d, 5th and 8th to the other Half; this often happens within 3 Notes of the Close; in such Cases the 6th and 4th are resolved into the 5th, and Sharp 3d.

Rule 7. An Imperfect or Flat 5th is accompanied with a 3d, and so is a 6th, when it has no other Figure placed with it.

Rule 8. When you meet with a 4 and a 5 over one another, and a sharp Flat natural, or Figure of 3 by the Side of the 4, that shews that the 4th is to be resolved into the 3d accordingly; this happens generally before Cadences, or Closes, especially when the 4th is to be resolved into the Sharp 3d, as in Rule the 6th.

Rule 9. The 7th is always accompanied with the 3d, and often with the 5th, as Occasion may require; the 5th being necessary in some Cases, in others it is too heavy. Secondly, When the Bass ascends by 4ths, or descends by 5ths, you generally see the Notes with 7's over them. Thirdly, When the Bass descends Half a Note (into any Note which is sharped) the 3d Note before the Close, it is generally marked with a Flat 7th,  
Flat

Flat 5th and 3d, but the 7th in this Case is more properly called an *extreme* Flat 7th, being no more in Quantity of Semitones than a perfect 6th, though called a 7th, on account of the Key. Fourthly, When the Bass descends Note by Note, then you will generally find a Figure of 7 and 6 after it over every Note, which shews you are to play a 7th and a 3d to Half the Time of the Bass-Note, and then resolve or convert the 7th into the 6th, (according to the Nature of the Key you play in) still continuing the 3d for the other Half of the Time.

Rule 10; When the Bass moves by even Quavers, such as 4 or 8 in a Bar, it is common to play the first 2 Quavers to the Chord of the first Note, and the next 2 to the Chord of the 3d Note, or to such Figures and Accompaniments belonging to the first and third Notes, except it be figured to the contrary.

TYRO. I am obliged to you for your kind Instructions, but I cannot say I understand them at present.

PHILO. I do not expect you should: it is to be supposed you should know something more of the Harpsichord, and be first of all more acquainted with the Nature of the various Keys in general, and the natural Order and Disposition of Flats and Sharps in each. Nothing of this Sort can be understood without *this*; and even *then*, without Practice and Observation, you would be at a Loss; though the Rules I have laid down are very plain to be understood by any one who has a Mind to learn, and pay a due Attention to what he reads: But it is too common a Practice, just to read an Author carelessly over, and then unjustly to say, That he has treated so dark and intricate upon the Subject that they can't understand it.

TYRO. It is very true, Sir, but you shall never have that to say of me. I can say, I have always attended to your Instructions, and I will try at all proper Opportunities to make myself Master of what I am still deficient in.

PHILO. I make no Doubt of it, *Tyro*; and it is for the Sake of such diligent and industrious Learners as you, that every Author takes Pains, and they are happy in such Pupils, and take a Pleasure to say, that you have done great Honour to them as well as Service to yourself.

TYRO. I am obliged to you, kind *Philomathes*, for your Opinion of me. This encourages me to ask you a further Favour, and that is, to give me one Example or Movement in a thorough Bass; for though I do not now immediately understand it, yet I possibly may.

PHILO. It is very true; Labour (it is said) overcomes all Things: But I rather would choose to say, *Delight* conquers all Undertakings. And as I have found you, my dear *Tyro*, pursuing earnestly after Truth and Knowledge, it gives me Pleasure to instruct you, and you have your Desire in this respect also,

so, by one full Example of a thorough Bass, Plate II. Fig. 5.  
And now, Tyre, what would you have more?

TYRO. I am satisfied, Sir, with what you have instructed me in; and give me Leave to repeat once more, that I promise to peruse every Thing you have treated of till I am Master of it; and therefore beg you would receive my hearty Thanks for your indulgent Favours.

PHILO. You are quite welcome; and to give you further Encouragement in the Progress of this innocent and useful Science, I here present you with a Hymn in four Parts, which has been highly approved of, and I hope will be agreeable to you and your Acquaintance.

*An Hymn, or Song of Thanksgiving on Account of the memorable Victory gained by the King of Prussia over the Austrians near Lignitz, on the 15th Day of August, 1760. See the Music, Plate III.*

## I.

To celebrate thy Praise, O Lord,  
We will our Hearts prepare;

*Repeat.* To all the list'ning World thy Works,  
Thy wond'rous Works declare.

## II.

The Thoughts of them shall to our Souls  
Exalted Pleasure bring;

*Repeat.* While to thy Name, O thou Most High,  
Triumphant Praise we sing.

## III.

All those who have his Goodness prov'd,  
Will in his Truth confide;

*Repeat.* Whose Mercy ne'er forsook the Man  
That on his Help relied.

## IV.

Sing Praises therefore to the Lord,  
From Zion his Abode;

*Repeat.* Proclaim his Deeds till all the World  
Confess none other God.

*Allluia.*

N. B. Every Verse is to be sung quite through softly, in two Parts only, and then repeat the two last Lines in full Chorus, loud.

F I N I S.



*FREDERICK'S Tune.*

Handwritten musical score for "The Rose Tree" in G major, 3/2 time. The score is for four voices: Treble, Contra, Tenor, and Bass. The Treble and Contra parts are mostly whole notes, while the Tenor and Bass parts have more complex rhythms including eighth and sixteenth notes. The Bass part includes fingerings (6, 5, 4, 3, 2) and a final 5/4 measure. The score is on aged paper with a large stain in the center.

*Alleluia Chorus.*

*Cantata Chorale.*

*Sopr.*

*Contr.*

*Ten.*

*Bass*

This image shows a page of handwritten musical notation, labeled "Plate III." in the upper right corner. The page contains eight staves of music, arranged in four pairs. The notation is written in black ink on aged, slightly yellowed paper. Each staff begins with a double bar line and a repeat sign (two vertical lines). The music consists of various note values, including whole, half, quarter, and eighth notes, as well as rests. Some notes are beamed together. There are also some accidentals, such as sharps and naturals. Fingerings are indicated by numbers 1 through 5 above or below notes. Some staves have a key signature of one sharp (F#). The notation is somewhat dense, with many notes and rests. The overall style is that of a handwritten musical manuscript.

# E R R A T A.

- Page 372, Line 15, for  $\frac{7}{8}$ , read  $\frac{7}{6}$ .  
 32, dele the 2d 88.8  
 34, for  $5:4::00:80$ , read  $5:4::100:80$ ,  
 Page 373,  
 2, for  $\frac{4}{3} \div \frac{1}{1} + \frac{2}{3}$ , read  $\frac{4}{3} \div 1\frac{2}{3}$ .  
 13, for  $2 \times 1 = 2 \times 2$ , read  $2 + 2 = 2 \times 2$ .  
 Ditto, for  $2 + 1 = 1''_3$ , read  $2 + 1 = 1\frac{1}{3}$ .  
 14, for  $2, 1''_3$ , read  $2, 1\frac{1}{3}$ .



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